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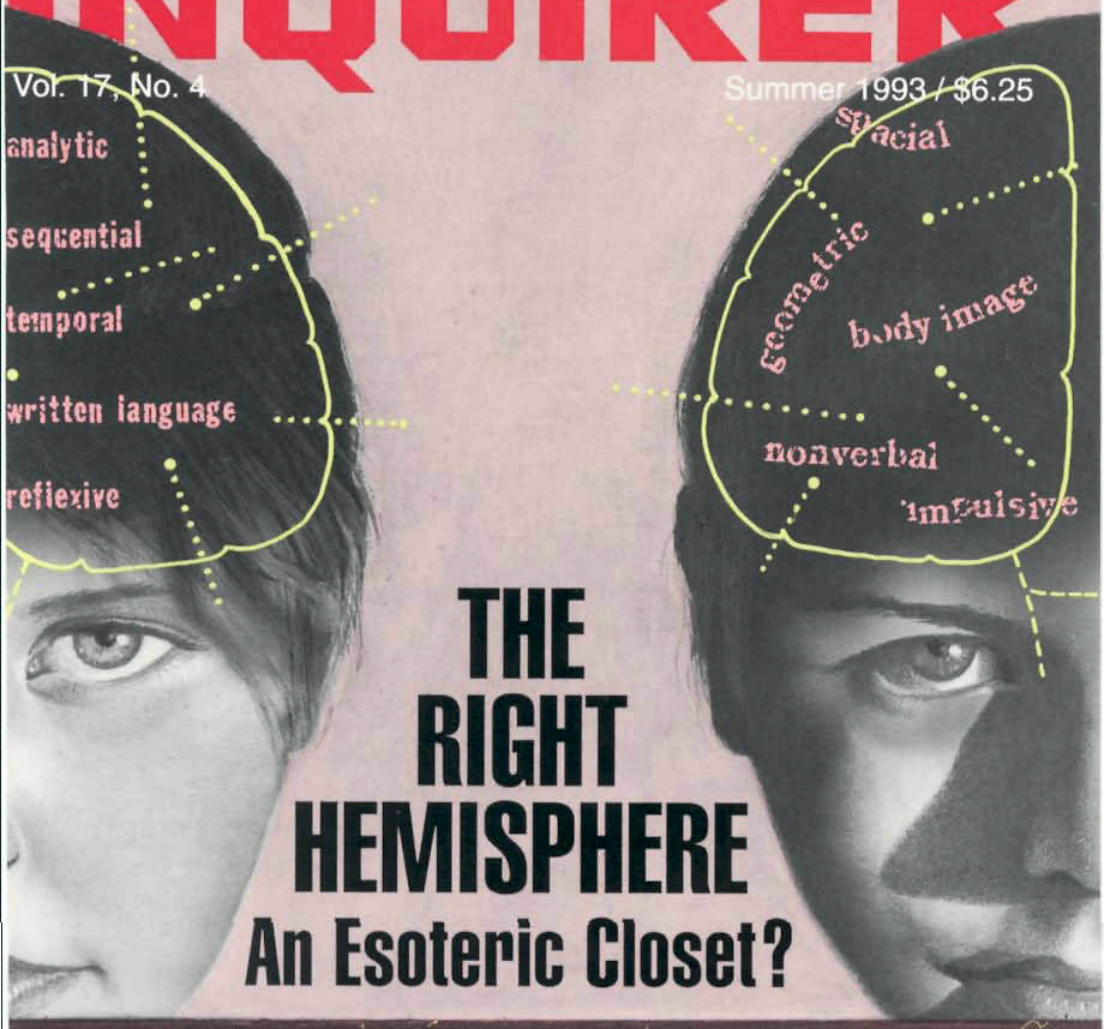

THE RIGHT HEMISPHERE

An Esoteric Closet?

False Memory Syndrome
The Eyewitness: Imperfect Interface
The Science Textbook Problem
Pathological Science
The 'Star Hustler'

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal, an international organization.

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HELP US DEFEND SKEPTICISM AGAINST HARASSING SUITS

CSICOP LEGAL DEFENSE FOUNDATION

In recent issues of the SKEPTICAL INQUIRER we have outlined the difficulties that the Committee for the Scientific Investigation of Claims of the Paranormal is experiencing because of harassing lawsuits filed against skeptics.

We feel confident that these suits will eventually be dismissed. Still, we suspect that the lawsuits were brought for reasons other than the redress of alleged grievances.

For what do these suits mean? They mean that the pro-paranormalists think they have finally found a way to strike below the belt of scientists and skeptics. For years they have been unable to prove their claims of miraculous abilities. They've grown tired of hearing our challenges. Now they have turned to intimidation by lawsuit in an effort to silence their only persistent critics.

It doesn't necessarily matter if the plaintiff wins or loses the suit. Their purpose is to waste their opponents' resources and to intimidate and silence them—in effect, depriving individuals or organizations of their First Amendment rights.

We are by no means a wealthy organization, but we are not prepared to surrender our rights. *We have vowed to fight back.* To do so, we need your support. CSICOP has established the CSICOP Legal Defense Foundation. Its funds will be used to help pay the costs of existing lawsuits and any that may arise in the future, and to countersue when appropriate.

Don't allow the claim-mongers to destroy CSICOP (and the values of science and reason it steadfastly represents) through unjust and frivolous legal proceedings. Support the CSICOP Legal Defense Foundation today. It's the best way to blunt this frightening new weapon of the apostles of nonsense.

Yes, I want to help defend the rights of skeptics. Enclosed is my tax-deductible contribution of $ _____

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From the Editor

Our Wide and Fertile Field

Observant readers may have noted that CSICOP's statement of mission, published on the back cover, has been expanded. This is how it now reads:

> The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues.

The second sentence is new, having been added in 1992.

Does this mean CSICOP and the SKEPTICAL INQUIRER have suddenly expanded their objectives? Not really. The expanded statement is more an attempt to reflect the reality of what our actual interests have long been. We have been gradually expanding our focus for years. All organizations, certainly all publications, are organic, dynamic entities, and any formal attempt to define their objectives can at best do so only imperfectly. The paragraph above is our (current) best effort.

We have always been involved in promoting an understanding of the values and diverse methods of science and the use of science and critical thinking as ways to gain a more accurate, realistic understanding of the natural world and of ourselves. (We humans, with our wonderfully complex minds, are of course a part of the natural world.) We have always valued science education, along with a broad liberal education. For several years now we have been publishing a continuing series of articles about science education. Recent examples are those by two educators in our Winter issue suggesting more hands-on science education, Vice President Al Gore's article on education for science in our Spring issue, and the article in this issue by a biologist, about the troubling quality of secondary-school science texts.

The final phrase in our statement refers to the use of reason (all the tools of scientific and rational analysis) to examine "important issues." This does—to a degree—represent something new. For some years we have cast our editorial net far wider than the world of "the paranormal." The term "fringe-science" is one attempt to describe this wider subject. "Pseudoscience" might be another. All are imperfect descriptions, each with its own biases and drawbacks.

Yet the tools of science and critical analysis can be applied, if done carefully, judiciously, and with some humility, to many of the complex science-related issues that face us all—certainly those for which testable scientific claims are made. The SKEPTICAL INQUIRER's focus remains mostly along science's fringe. But this troublesome area—where good science and bad science, real science and bogus science, and everything in between, coexist in uncomfortable disharmony—is a broad and fuzzy one. Clear demarcations, black and white extremes, may be discernible, but often the dominant colors are shades of gray and the spectrum of *responsible* disagreement may be distressingly wide.

We are finding ourselves editorially exploring this region more and more lately. I have a list on my wall of 35 subjects we have examined in our pages in just the past two to three years that don't fit any classic description of the "paranormal."

Some examples: polygraph tests, abuses of hypnosis, the anti-Satanism movement, claims of ritualistic cult abuse, subliminal advertising and tapes, backmasking, graphology, creationism, alternative medical treatments, mass illness hysterias, literary deconstructionism regarding science, multicultural pseudoscience, hi-fi pseudoscience, night terrors and sleep paralysis, the disease theory of alcoholism, self-help books, cold fusion and pathological science, probability paradoxes, and innumeracy. The articles in our Spring issue on Facilitated Communication and in this issue on brain-hemisphere misconceptions and false-memory syndrome are three more.

Many involve important issues that make mainstream news, cause problems, raise disturbing questions, affect our lives. All merit serious, scientifically informed analysis. We're trying to provide that.

All these subjects are essentially nonparanormal, yet some of the arguments and rationalizations invoked to support them seem hauntingly similar to those heard from proponents of such classical "paranormal" fields as extrasensory perception and astrology. All these areas and many more can profit from additional open-minded skeptical inquiry.

This new arena is large, but don't look for us to go much beyond areas where scientific claims are being made. The issues we address must have some scientific content—or pretend to it—or benefit from an understanding of human psychology. Many readers want us to critique religion *as such* or skewer some ideology they disfavor. That's not our interest and it's not our intention.

Also don't look for us to take up too many scientific controversies clearly *within* the borders of science. All scientific ideas have to battle for initial acceptance, and the road toward any scientific consensus is exceedingly long and difficult, as it should be. These battles are fought in traditional scientific forums, which are well established for them (general journals like *Science* and *Nature*, specialized journals by the thousands, meetings, conferences, referee reports, grant evaluations, review panels, and all the other apparatus of modern science). We may occasionally dip into these areas when we think we have something useful to add. (Recent CSICOP conferences have especially done this.) We do want occasionally to give the flavor of these disputes, for they show how every field of science is continually stimulated by novel ideas, claims, and evidence, which are then subjected to rigorous debate and scrutiny.

Some recent examples of such articles are "Safe Science with SETI"

in our Spring 1993 issue, our look at the new catastrophism back in 1990, and articles on biological cycles, quantum mechanics, the Gaia hypothesis, and the Big Bang.

So you can see that even though our view remains fairly focused, we have a very wide and fertile field in which to roam. We intend to continue to provide lively, readable, provocative, scientifically informed analyses of issues important to you. We will continue to provide scientifically evaluated factual information you can use in making your own judgments, whether you are a scholar, participant, or interested observer. We will continue to provide a forum for debate and discussion of all issues raised in our pages. (One reader recently commented that our letters to the editor section was the best he'd ever seen.) We will try to give a flavor of the excitement and vigor of scientific discovery and debate. And we intend to continue to have fun doing all this, and hope you too will enjoy the quest.

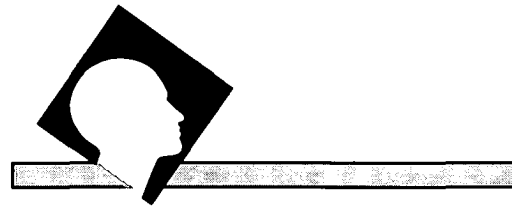
—*Kendrick Frazier*

OUT THERE Rob Pudim

I DOUBT YOU DOUBT THAT.
THAT'S ONE EXPLANATION
DO YOU KNOW THAT OR JUST BELIEVE IT?
HOW DO YOU KNOW YOU KNOW?
ANYBODY CAN WRITE ANYTHING.
JUST BECAUSE IT EXPLAINS IT DOESN'T MAKE IT TRUE
I DON'T KNOW ANYTHING AND NEITHER DO YOU.
YOU DON'T HAVE DOCUMENTATION
HOW DO I KNOW I KNOW?
YOU CAN'T SAY THAT.
I DOUBT YOU DOUBT I DOUBT THAT

SKEPTICS FROM HELL.

From the Chairman



Exploring the Television Wasteland

PAUL KURTZ

It is a truism that the mass media are replacing the schools as the major source of information and education for the American public. Regrettably, "entertainment value" is the chief criterion for television programming. As the networks vie for ratings, advertising revenue, and profit, sensationalism overwhelms reflective considerations.

This is especially demonstrated by the sorry state of television talk-shows. Although these programs provide a forum for differing ideas and personalities, they often lead to misinformation, untruths, and distortion. This is the case not only in the United States, which is considered by many to be the bastion of vulgar pandering, but in other countries as well.

A striking example of this is the daytime television talk-show called "Shirley," hosted by Shirley Solomon and aired on the CTV network in Canada. It competes with American shows like "Oprah," "Sally Jessy Raphael," "Donahue," and "Geraldo" for viewers, and it now enjoys the highest ratings of any TV talk show in Canada. So popular has it become—discussing everything from sado-masochistic sex orgies and breast implants for women to paranormal miracles—that ABC has been negotiating to network "Shirley" throughout the United States.

CSICOP has been approached several times to provide guests for the "Shirley" show, and we have done so, although often with apprehension since the program is invariably stacked against scientists and skeptics, which makes it difficult for the scientific outlook to be fairly presented. We have debated whether we should even take part in such charades. When we do, it is because we feel that *some* dissenting voice is better than none.

After declining several invitations over the past year, I finally consented to appear on a "Shirley" program, one that was taped in Toronto on March 11, 1993, for a later broadcast. The topic was "Prophetic Dreams."

In my view, there is no reliable evidence that dreams can foretell the future. Efforts to test precognition in the laboratory have not provided us with a replicable experiment. The evidence we have for prophetic dreams is anecdotal and so highly subjective that it is difficult to corroborate. Many people nevertheless report that there have been remarkable congruences between their dreams and later events. These often involved dramatic personal crises, such as the death of a loved one. One can ask if such experiences can be explained as simple coincidence, or perhaps some function as self-fulfilling prophecies,

inducing us to realize our dreams. They need not be considered paranormal.

When the producers invited me to appear, they said there would be three guests who would recount remarkable precognitive dreams and that I would be given the opportunity to present my interpretation. They also told me that another "expert" besides myself would appear, one who had done "research on dreams" and would give us the benefit of her work. I was assured beforehand by the producers that Shirley herself was "somewhat skeptical."

The show opened with about two hundred people in the audience. Shirley began by asking how many people believed that dreams could foretell the future. An affirmative shout went up from virtually everyone in the audience.

Shirley called her guests to the stage one by one. The first guest, Gail Boyce, had responded to a newspaper ad placed by CTV for people who had had "prophetic dreams." She had been booked on the show at the last minute and was flown up from Long Island only two hours before showtime. Boyce said that she dreamed of future events that invariably came true.

She dreamed that her 14-year-old son had been shot in the head and that two uniformed men, one in white and one in brown, came to her home to tell her that her son had been killed. Two weeks later her brother (who was in the army) was murdered, and two men, "exactly as dreamed," had come to notify her of his death. "For three months I took off from work," she said. "I was really upset because I hadn't warned my brother beforehand that I saw his murder."

She then dreamed that another brother had died: she saw him completely nude in the hospital, where he had had cardiac arrest; and later he was in a coffin with a rubber glove on his hand. Boyce's dream came true. She also dreamed that her daughter, who had been living with her father, Boyce's ex-husband, had been murdered. She saw her daughter's body, clad in a pink blouse, drowned in the bathtub. She said that she was so frightened by this dream that she persuaded her former husband to allow the daughter to live with her. She has burned the pink blouse and makes sure that her daughter is never alone, day or night, so that the dream cannot be fulfilled. "I saw my daughter floating face-up in the bathtub. Someone had drowned her. My daughter can't be home by herself, and she can't wear anything pink. I am terrified that the dream will come true."

Shirley questioned Boyce and was very sympathetic to her predicament. There was almost no dissent.

The second testimony was given by Rita Dudak (now Rita Dwyer) about a dream alleged to have been experienced in 1959 by Ed Butler. This "prophetic dream" has been included in the book *Dreams* (Time-Life *Mysteries of the Unknown* series, in chapter 4, "Psychic Dreams," pp. 130-131). The dream occurred when Butler was 25 years old and employed by a New Jersey company that worked with rocket engines and fuels. In his dream he was seated in his laboratory when an explosion rocked the building. As he rushed out of the room, he found Rita Dudak, a co-worker, engulfed in flames. He dreamed that he grabbed her by her leg, dragged her out of the blazing laboratory and dowsed the flames. Butler had this dream several times over a period of months, and on April 23, 1959, the incident occurred "exactly as he had dreamt it." Only because he knew she would be saved did he muster the courage to pull her free. Dudak, who believes in prophetic dreams and is now president

of the "Association for Dream Research," gave details of the event. Butler was brought into the show by remote satellite on a TV screen, "authenticating" the story.

The third example of prophetic dreams was described by Paul Csete and occurred in 1977. He said that he was "into the supernatural" and believed that dreams could foreshadow the future. He also said that if you don't like the dream, you can change the future by dreaming a different scenario. In the dream he recounted, he was driving on a highway behind a slow-moving truck, with poles sticking out of the rear. He decided to pass the truck and so sped up the left lane, when suddenly a white station wagon with "five or seven" people in it was coming toward him. As he was about to slam into it, he woke up in a fright.

Many years later he was driving in Mexico, and amazingly found himself behind a similar truck and was planning to pass it. As he he was about to do so, the person in the passenger seat beside him, who had been dozing, exclaimed, "Don't you dare!" and so he stayed put. At that very moment he suddenly saw a white station wagon with "five or seven" passengers approaching, and it passed him on his left—exactly as in the dream. He thus avoided a possibly fatal collision.

After more than half the show had elapsed, I was brought onto the stage to analyze these dreams. I pointed out that what we had been given was anecdotal information and that there was no way to verify the stories. I felt this was a fairly commonsense observation and was surprised when the audience immediately jeered at me.

In regard to Gail Boyce, I said that the first dream was not a "hit," because she had dreamt that her *son* was killed, not her brother. Her reply was that she considered her brother to be like a son. In regard to the third dream, I said that it had not come true yet and that I thought she was behaving hysterically. When Shirley lashed out, saying that I was being sexist in accusing Boyce of being hysterical, I replied that hysteria can be experienced by men as well as women. I suggested that Boyce might need psychiatric counseling, because if, on the basis of a dream, she is keeping her daughter confined, then she is confusing the dream world with the real world. Again the audience booed my observation. But what they did not hear was Boyce's telling me just prior to the show that many of her friends thought she was "crazy" and that she was indeed undergoing psychiatric counseling.

Shirley interjected, "Ah! But the second dream was a true match!" To which I replied, "How do we know? We have only Gail's say-so that the dream was exactly like what occurred and she may have altered the dream after the fact." I said that the entire incident was in the eye of the beholder and that we should be skeptical of uncorroborated reports of psychic experiences. Again the audience booed.

In regard to the Ed Butler/Rita Dudak incident, which was not reported publicly until 1988, 29 years after the fact, I said that, first, Butler worked in a dangerous lab and, second, since Dudak was his only female coworker, the fact that he dreamt about her being at his laboratory was not a mystery. Moreover, his memory of the dream may well have been colored by later experience. Butler said he had never had a prophetic dream. "What is the base-line of probability?" I asked. "How many dreams have people had that did not come true? Why select the one hit out of the hundreds, or probably thousands of dreams that were misses?"

Coincidence seems to be the most plausible explanation.

In regard to the third dreamer, Paul Csete, I again pointed out Paul believed his dreams were prophetic, but neither in his dream nor in real life did he collide with the "white station wagon." Is he also reinterpreting the dream after the fact. Paul reported that his dreams were "subjectively true" for him.

I was brought in to represent an independent scientific and skeptical viewpoint. Another guest, Gayle Gackenbach, a Ph.D. and "an experimental psychologist," said that dream analysis is useful, since dreams tell people about themselves. She said that, although she was skeptical of anecdotal information, she believed "that dream telepathy has been scientifically verified" in the laboratory. I asked if she thought there was evidence that dreams were prophetic. She said she couldn't say. But she maintained that she sympathized with Gail. I asked her if she thought that Boyce should keep her daughter confined on the basis of the dream. Gackenbach replied that if she dreamt that her own daughter had been murdered she likewise would have behaved protectively. I expressed my surprise and said that a person should distinguish between the dream world and reality and that she was not thinking rationally. Again the audience jeered. I responded that I was in the unenviable position of striking a dissident note among the nigh-unanimous choir of believers. Shirley then asked the audience, "How many people are skeptical?" Only 2 out of the 200 responded affirmatively—though one young man immediately got up to say that he had been a skeptic before the program, but "after listening to Kurtz's criticism" is now a believer!

One member of the audience, who identified himself as an astrologer and a psychic, said that "dreams foretell the future." He advised people to pay close attention to their dreams. By saying a prayer before going to bed, he said, one can learn to have dreams that will come true.

I then asked in dismay, "Doesn't anyone appreciate the methods of science, of the natural and social sciences. Doesn't anyone want to use critical intelligence and apply objective standards to judge these claims?" Again I was jeered. And one woman said it was I who was irrational, rather than everyone else.

It was clear that the deck was stacked against the skeptical viewpoint—five guests and the moderator, plus 198 out of 200 members of the audience, made it clear that they thought that dreams could foretell the future and that they could remake the future by having a different (revised) dream or by taking steps to avoid a dream's fulfillment. What kind of view of reality does this entail? If dreams are precognitive, and if you can change the future, then what are they precognitive of? No one in the audience worried about such niceties.

After the show I sought out one of the producers who had invited me. I said that I deplored the lack of balance, the failure to have the scientific and skeptical viewpoint better represented. I asked whether they did not have some obligation to present at least an alternative viewpoint to the public, to which she replied, "Dr. Kurtz that's why we brought you on."

Henry Gordon, a Toronto newspaper columnist and a professional magician, had been invited to appear on an earlier "Shirley" show, "Hypnotic Regressions and Past Lives," but at the last minute was disinvited. When he asked Mary Hawkins, the researcher he dealt with, what had

happened, she said: "The other guests knew you are a vigorous opponent of anything to do with psychic phenomena. They were disturbed that you were going to be on the show, and they said, 'Well, we can't be on the show if he's on it.' " And so a skeptic is persona non grata on most shows, and very rarely is more than one invited.

Les Kottler, producer of the "Shirley" show and Shirley's husband, said: "I'd bend over backwards on every subject we do to be balanced. Audiences tend to sway a show. . . . We have a house that seats approximately 200 people. We try to book 100 in favor and 100 on the other side of the issue." Surely this was not the case for the show in which I appeared, where the audience nearly unanimously believed in precognitive dreams.

What I encountered on the "Shirley" show was not atypical. Increasingly, talk shows have been dominated by the lowest common denominator. I remember appearing on the "Merv Griffin" show many years ago, with physicist Bernard Leikind as the co-guest, to present in eight minutes some criticisms of astrology, psychic phenomena, and firewalking. During the intermission, Merv said to me, "I don't believe in any of this bullshit, but that's what the public wants." And week after week he fed his audience a steady diet of paranormal claims.

I should point out that my personal experience on the "Shirley" show came during the same week that Bill Moyers presented the five-part "Healing and the Mind" series on PBS, with almost no skepticism about the claim that mental concentration can heal illnesses; "The Incredible Discovery of Noah's Ark" appeared on the CBS network, maintaining that Noah's creationist stories in the Old Testament were true, with nary a dissent; and Paramount Pictures launched *Fire in the Sky*, a movie based on the alleged "true story" of Travis Walton's UFO abduction. In a free society, people can produce whatever they want. But do not producers and editors have *some* responsibility to public education, or should entertainment values be allowed to undermine all scientific literacy and knowledge? How can we impart the need for some scientific objectivity and critical rationality?

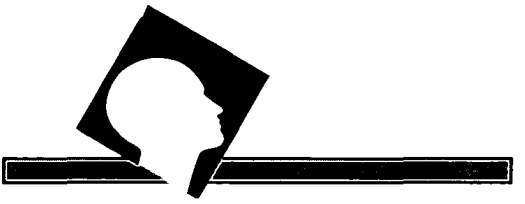
Is there a remedy for the continued purveyance of the paranormal without scientific dissent? That is the question that I pose to our readers and to other members of the scientific community who share CSICOP's concern about the vast media wasteland. □

The Uneasiness About Thinking

There is an uneasiness about thinking, about intellectual endeavour . . . that permeates the society, and that is clearly extremely dangerous. . . . I think it is an essential aspect of the national health and well-being to have not just professional scientists who are happy and healthy but to have a broad population of citizens who are comfortable with science and ask tough questions and make informed decisions.

—Carl Sagan, at the national meeting of the American Astronomical Society, Phoenix, January 5, 1993.

News and Comment



Court Awards CSICOP Sanctions in Geller Suit

A federal court has imposed $106,433.97 in sanctions against self-proclaimed psychic Uri Geller for his prosecution of a libel suit against the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP).

In an order issued by Judge Stanley S. Harris on March 16, the United States District Court for the District of Columbia granted CSICOP's request that the court impose the sanctions, which represent the fees and costs incurred by CSICOP in defending the lawsuit through June 30, 1992. The court also authorized CSICOP to request reimbursement of additional fees and costs incurred in defense of the litigation.

Geller initiated the $15-million lawsuit in May 1991 against CSICOP and James Randi, alleging that Geller was defamed by Randi in statements made to the *International Herald Tribune*. Last June, Judge Harris dismissed the suit against CSICOP and granted CSICOP's request for sanctions (*SI*, Fall 1992), but postponed a ruling on the amount of the sanctions until a later time. Geller then filed a motion with the court, asking for a reconsideration of its opinion.

In its recent order, the district court rejected Geller's motion for reconsideration and imposed the sanctions. The amount was to be paid within 30 days, Judge Harris said.

In a declaration filed with the court in Geller's lawsuit, CSICOP Executive Director Barry Karr stated, "I believe that CSICOP was made a defendant in this lawsuit solely for the purpose of harassment and intimidation and in the hope that the lawsuit would dissuade CSICOP from encouraging and providing a forum for . . . the critical discussion and analysis of paranormal claims, particularly those asserted by Geller."

As was observed at the time of the earlier ruling, Judge Harris's imposition of sanctions against Geller was made pursuant to a federal court rule that mandates the award of sanctions if litigation is "interposed for any improper purpose, such as to harass or cause unnecessary delay or needless increase in the cost of litigation," or if papers filed with the court are not "to the best of the signer's knowledge, information and belief formed after reasonable inquiry . . . well grounded in fact . . . and warranted by existing law or a good-faith argument for the extension, modification, or reversal of existing law."

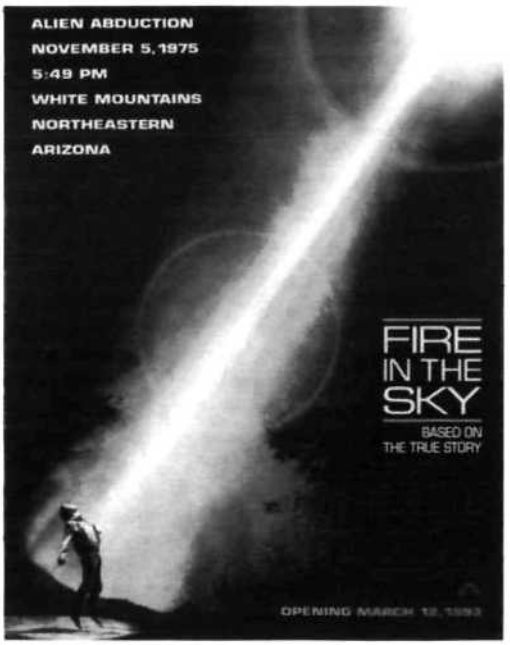
Following notification of Judge Harris's order, CSICOP Chairman Paul Kurtz commented that this type of libel suit, even if ultimately unsuccessful, threatens to chill debate on scientific issues. "If such obstacles are placed, unchecked, in the way of scientific research, and if one cannot question extraordinary claims, then a serious blow will be dealt to freedom of expression and scientific inquiry. . . . We view this case as a serious challenge to our First Amendment

rights, and we are thankful that Judge Harris chose to vindicate those rights." In addition, Kurtz observed, the judge's decision to impose sanctions against Geller "sends a stern warning to those who would utilize libel suits as a weapon to harass: such conduct can carry a heavy price."

As of this writing, Geller has not paid the court-imposed sanctions, prompting CSICOP to file motions asking the court to take actions it deems necessary to enforce the order. Geller has also filed a new motion asking the court to reconsider its earlier reconsideration. CSICOP will oppose this motion. □

CSICOP Challenges 'Fire in the Sky' Film

Ten days before the Paramount Pictures film *Fire in the Sky* opened on March 12, the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) challenged Paramount's claim that the film is based on a "true story." In a statement, CSICOP Chairman Paul Kurtz commented that "the film is largely fiction and ought to be labeled as such. The public is being deceived by Paramount's promoting the film as a true story."



Fire in the Sky is based on the claim of Travis Walton, of Snowflake, Arizona, that in late 1975 he was "zapped" and abducted by a UFO and held hostage for five days.

Philip J. Klass, the chairman of CSICOP's UFO Subcommittee, who spent many months investigating the alleged incident shortly after it was reported, uncovered extensive evidence to indicate the incident was most likely a hoax. This evidence and details of Klass's rigorous investigation were reported in his book *UFOs: The Public Deceived* (Prometheus Books, 1983).

Klass learned that shortly before Walton's alleged abduction he had told his mother that if he was ever abducted by a UFO she should not worry because he would be all right.

Later, when Travis's mother was informed that her young son had allegedly been abducted by a UFO, she took the news calmly and responded, "Well, that's the way these things happen," according to a law-enforcement officer who was present.

During the several days that Travis was "missing" his older brother, Duane, was asked if he was concerned for Travis's well-being. Duane replied that Travis was "having the experience of a lifetime. . . . All I can say is that I wish I was with him."

Shortly after Travis reappeared, he was given a "lie detector" test, administered by Jack McCarthy, then one of the most experienced and respected polygraph examiners in Arizona. After a lengthy test involving Walton's claim of UFO-abduction, McCarthy reported: "Gross deception." Further, McCarthy reported that Travis was holding his breath to try to "beat the machine."

Kurtz said: "The public is being inundated by Hollywood films and television programs claiming that thousands of Americans are being abducted by aliens. These programs offer no credible scientific evidence or critical dissent. They seem to be motivated solely by profits, and no matter how outrageous a claim there is always somebody willing to turn it into a 'true' movie."

"None of the cases," stated Klass, "stand up under scrutiny. They can be given natural, prosaic explanations without postulating extraterrestrial visitation and kidnapping. But, of course, Hollywood wouldn't be able to turn that into a movie."

"Many in the media release irresponsible and sensationalistic reports of abductions. There is a critical need for balanced reporting and labeling," said Kurtz.

The SKEPTICAL INQUIRER invited Paramount to comment on CSICOP's criticisms, but received no response. AP science reporter Lee Siegel, however, quoted Tracy Torme, the film's screenwriter and co-producer: "There is no substantial hard evidence beyond polygraphs to show what happened. So while I believe he [Walton] is being truthful in relating what he remembers, I will not say and cannot say what happened to him."

Siegel's article, which focused on CSICOP's criticisms and quoted Klass in some detail, was published in newspapers nationwide. □

Princeton Experiments in Remote Viewing Found Plagued with Defects

For the past decade, the experiments of Robert Jahn and his colleagues at the Princeton Engineering Anomalies Research (PEAR) program have intrigued all those interested in parapsychology. Jahn, a former dean of engineering at Princeton, had decided to devote considerable time and resources to a lengthy series of experiments, hoping to overcome critical objections that have plagued previous such efforts. Many of these experiments involve attempts to "psychically" influence random-number generators; others involve attempts to "remote-view" a distant scene.

In the remote-viewing work, a percipient (receiver) attempts to describe an unknown geographical location where an agent (sender) is, has been, or will be at a specific time. PEAR didn't actively seek the limelight, but finally in 1986 and 1987 Jahn and colleague Brenda Dunne published positive results about the remote-viewing experiments in three peer-refereed journals. The group's most recent report, "Precognitive Remote Perception III," by B. J. Dunne, Y. H. Dobyns, and S. J. Intner, published as Technical Note 83003 in 1989, includes results of 336 formal remote-viewing trials and is apparently the single largest database of remote viewing that has been reported in some detail. In one mode (211 trials) the agent was free to choose the target; in the other mode (125 trials) the target site was randomly selected from a pool of potential targets.

While some embraced the PEAR

remote-viewing work, most parapsychologists maintained their distance from it. Skeptical scholars cited many deficiencies, but little formal critical examination of the remote-viewing experimental program was published.

That situation has now changed.

Three investigators, George P. Hansen, Jessica Utts, and Betty Markwick, have published a devastating critique of the PEAR remote-viewing experiments in the *Journal of Parapsychology* (vol. 56, June 1992, issued in February 1993).

They identify a variety of methodological and statistical problems with the work. They discovered specific problems in randomization, statistical baselines, application of statistical models, agent coding of descriptor lists, feedback to percipients, sensory cues, and precautions against cheating. "The research departs from criteria usually expected in formal scientific experimentation," say Hansen, Utts, and Markwick.

What were some of the objections? Randomization for one. Hansen et al. found, for example, that in the 211 trials in the "volitional" mode, "there was no random selection of the target whatsoever." Neither was there adequate shielding of the agent from the percipient. Without such shielding, they say, "it is virtually impossible to detect even simple trickery." They point out that they have no reason to believe that cheating took place. But they also note, as Dunne herself had, that just one particular subject, Operator 10, accounted for 244, or more than 70 percent, of all the formal trials. "Because the procedures allow deception by either percipient or agent acting alone, the contribution of that subject should be considered." If that subject's trials are removed from the set, the results are no longer significant.

The authors also say the 1989 Dunne et al. technical report contains a number of invalid statistical arguments. For example, their analysis didn't take into consideration that targets were selected *without replacement*, which has important consequences for statistical analysis. They also say Dunne et al. failed to include certain elements in their baseline distribution, thus artifactually enhancing significance levels.

Hansen, Utts, and Markwick conclude their paper with this remarkably blunt assessment:

> The PEAR remote-viewing experiments depart from commonly accepted criteria for formal research in science. In fact, they are undoubtedly some of the poorest quality ESP experiments published in many years. The defects provide plausible alternative explanations. There do not appear to be any methods available for proper statistical evaluation of these experiments because of the way in which they were conducted.

A 32-page response from the PEAR group to the Hansen et al. critique follows in the same issue of the journal. It contends that most of the isssues raised by Hansen et al. had long been acknowledged and adequately addressed in their experimental designs and analyses. "The remainder of their concerns, including randomization of target and reference score distributions, trial-by-trial feedback, stacking, and cheating, are either misapplied, fundamentally incorrect, or have trivial impact. . . . None of the stated complaints compromises the PEAR experimental protocols or analytical methods, which remain rigorous and effective methodologies from remote perception research."

Hansen told the SKEPTICAL INQUIRER a formal reply to the PEAR response is being prepared for publication.

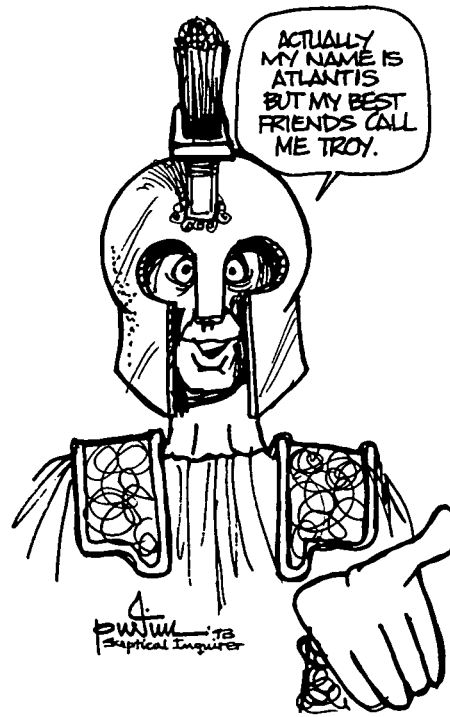
—*Kendrick Frazier*

Legend Deciphered? Atlantis Was Troy, Says Geoarchaeologist

Since its description by the ancient Greek philosopher Plato (427-347 B.C.) some two thousand years ago, people have been fascinated by the legend of Atlantis and speculation as to the location of this submerged island has been diverse. The geoarchaeologist Eberhard Zangger, of the German Archaeological Institute in Athens, Greece, has now proposed a scientifically based theory that Plato merely availed himself of a historical Egyptian account of the famous ancient city of Troy, situated on the west coast of Asia Minor, which he used as a basis for his description of Atlantis and the legend.

As Zangger states in his book *Atlantis—Deciphering a Legend* (Droemer Knaur, Munich, 1992), the Atlantis report emerged in the sixth century B.C. during a conversation between the Greek statesman Solon (640-560 B.C.) and a priest from Sais, then the capital city of Egypt. Plato recapitulated the legend of his ancestor Solon in 360 B.C. in the writings *Timaeus* and *Critias*—preserving it for later generations, who generally regarded the account as fiction. In his report, the Egyptian priest mistook the Greek region of Attica for the Argolis plains on the Peloponnese. The reader learns that a Greek civilization—the culture of the late Bronze Age—was destroyed by the simultaneous occurrence of earthquakes and tidal waves.

In his research into early Greek culture and its natural environment, Zangger discovered traces of a huge landslide and a flood catastrophe after drilling in the area around Tiryns, which 3,200 years ago was buried under meters of rubble on the outskirts of the Mycenaean fortress in Tiryns. Subsequent research by German scientists has since proved that this catastrophe was triggered by an earthquake. The downfall of the Mycenaean culture ran parallel to the collapse of numerous states of the eastern Mediterranean in the late Bronze Age—or to quote Zangger: "What happened here was a collapse of a system." Within only 100 years many cultural and technical achievements of the Bronze Age were lost: the centralized political power, the administrative structure, and the art of writing—a phenomenon mentioned specifically by Plato. The collapse in both Argolis and the states of the Mediterranean became established in oral tradition and later in Solon's account of Atlantis. Zangger interprets Plato's Atlantis as referring to a huge disaster that took place around



1200 B.C., when most of the Mycenaean palaces were destroyed by landslides, earthquakes, and fires.

Solon's source and interlocutor, the Egyptian priest from Sais, interwove this catastrophe scenario with the legend of Atlantis. According to Zangger, the description of the landscape around Atlantis resembles the area around Troy, which lies at the mouth of the Dardanelles in the Mediterranean.

The priest further reported that Atlantis was an island lying in the Atlantic Ocean at the Pillars of Hercules—two characteristics that seemingly refute the identity of Troy as Atlantis. Zangger explains this contradiction by pointing out that in ancient Eygpt the state of Greece to the north was a conglomerate of islands and that the countries in and around the Aegean Sea were called "The Islands." Similarly, the Pillars of Hercules were none other than the Dardanelles in Solon's time. Even in late Roman antiquity the Straits of Gibraltar and the Dardanelles were both referred to as the Pillars of Hercules. Furthermore, in contrast to the Dardanelles, Gibraltar lay beyond the reach of the ships of the eastern Mediterranean countries during Solon's time. Even the designation "Atlantic Ocean" was misleading, as this name emerged only 100 years after Solon's Egyptian sojourn and was only subsequently included by Plato in his account of Atlantis. The name Atlantis alone shows where it once had lain—for the Greek word *Atlantis* means "daughter of Atlas." And by a strange coincidence Atlantis is the progenitor of the Trojan royal lineage.

Plato remarked that Atlantis was surrounded by water rings and that the people of Atlantis had dug a canal around the city, stretching from the sea to the outer water-ring. Zangger maintains that there is much evidence to corroborate this, and the Trojan plains abound in old canals and inexplicable banks of sand. In Zangger's view, these sand deposits, which had already been noticed by the discoverer of Troy, Heinrich Schliemann, are none other than the excavation rubble from artificial dikes or trenches. Furthermore, almost every topographical map of the Trojan Plains has recorded a 9-km-long watercourse running in the direction of the Acropolis of Troy.

—*Gottlieb Öchsle*

From the German Research Service Special Science Reports, *vol. 8, no. 8, 1992.*

James Randi Prize Awarded in Hungary

During his visit in January 1992 to Budapest, Hungary, James Randi was asked to address the winners of a science essay competition for high-school students sponsored by the popular science journal *Termeszet Vilaga* ("The World of Nature"). Touched by the eagerness and fresh enthusiasm of the youngsters, Randi founded a prize of U.S.-$300 for the best investigation of paranormal phenomena by students using scientific methods, irrespective of its conclusion.

Applications were invited and the best contribution was selected by a committee consisting of scientists as well as members of the journal's editorial board.

The winners of the 1993 James Randi Prize are Gábor Takács and Róbert Dallos of Székesfehervár,

Hungary. The boys, both 17-year-old juniors at St. Stephen Agricultural Technicum—a high school specializing in agriculture—decided to repeat the performance of English farmers preparing a crop circle, which they read about in the Hungarian daily *Reform*.

During the night of June 8, 1992, they prepared a crop circle near Székesfehervár, in the vicinity of a drive-in movie, using a rope and a stick. Since the length of the rope just happened to be 18 meters, the diameter of the circle was necessarily 36 meters, a number that "experts" attributed special significance to. Contrary to expectations, it took the boys about three hours of hard work to prepare the circle, since they didn't want to make any noise or disturbance. Since the crop was still green, it could be bent without breaking and loss of seeds. While they made special efforts to cover the tracks they had made, heavy rains following the event further obliterated any sign of fabrication. The youngsters then sat back to wait until the "discovery" was made.

The crop circle was discovered on June 26, 1992, by László Ötvös, a helicopter pilot of the Aerocartias air rescue service, who reported his discovery to his superiors as well as the press. After the press release of the finding the usual pandemonium broke out. "Experts" from all over the country investigated the site and the circle, and by drawing numerous conclusions they declared it to have been created by UFOs. Thousands of people visited the site waiting to see UFOs landing and at the same time caused considerable damage to the crop.

The hoax was disclosed in a popular TV show hosted by Sándor Friderikusz on September 3. The kids proved their case by showing photos taken from exactly the same position before and after the circle was made. The TV show was a tremendous success, since in front of millions of viewers the invited "UFO experts" were shown to have been completely wrong.

After the disclosure, the owner of the field, Aranykalász Co., sued the youngsters for Fts. 630,000 (approximately U.S. $8,000) in damages. The Hungarian Skeptics immediately offered moral as well as financial help to the young "skeptics." A few months later the court ruled that the kids are responsible only for the damage caused in a circle of 36 meters diameter, amounting to about Fts. 6,000 (U.S. $76.00). The rest of the damage was caused by the media.

The "crop circle kids"—as they are now called in Hungary—were awarded the first James Randi Prize on February 7, 1993.

—*Gyula Bencze*

Gyula Bencze is a physicist with the Central Research Institute for Physics, in Hungary.

AAAS: Wild Archaeology, Antievolutionism, and the Objectivity Crisis

In addition to all the science, this year's meeting of the American Association for the Advancement of Science (AAAS), in Boston, had much of specific interest to our readers.

• CSICOP Fellow Eugenie C. Scott (National Center for Science Education) hosted a half-day symposium on

"The New Antievolutionism." She warned that there is still "surprising strength" to the creationist movement. One of the creationists' latest tactics is not to use the word "creationism." They call it instead "Intelligent Design Theory" or "Abrupt Appearance Theory." The content, she said, is the same.

• CSICOP Fellow Stephen Jay Gould (Harvard) lectured about writing about science for the intelligent public in an afternoon session devoted to "Biological Writing in the Public Domain." The session gave particular attention to Gould's own writings, with comparisons to the great nineteenth-century scientist/writer T. H. Huxley. Gould lamented the rise in this century's age of specialization of a dichotomy between writing for the scientific domain and writing for the public and said he is trying to keep alive the "honorable, humanistic sense of writing for a general, educated public."

• Stephen Williams (Harvard), author of *Fantastic Archaeology*, gave a talk about the wild side of archaeology, including the Kensington Runestone (which he noted was "quickly debunked"), Mound Builders, Vikings on the Charles River in Massachusetts, and other dubious claims about pre-Columbian European settlements in North America, including those by modern transatlanteans like Cyrus Gordon and Barry Fell. These undocumented transatlantean interpretations "rob Native Americans of their heritage," Williams said. He faulted archaeologists for not doing a good job of telling "the real story of North American archaeology."

• Radio reporter Larry Massett received a AAAS-Westinghouse Science Journalism Award for his "Pseudoscience: On the Edge of Reason," a Soundprint program from Baltimore, broadcast May 27, 1992. This 29-minute radio documentary featured on-scene reporting from Robert Jahn's Princeton Anomalies Research Laboratory, with a good evaluative perspective provided by Chip Denman, a University of Maryland statistician, about both Jahn's experiments and dowsing claims.

• Historian Gerald L. Geison (Princeton) reported in a lecture, "Louis Pasteur: Lab Notebooks and Scientific Fraud," three cases in which Pasteur violated ethical principles widely acknowledged and shared at the time, including by Pasteur himself. In one case, Geison discovered that Pasteur deliberately deceived the scientific community about the nature of a vaccine he administered, in order to mislead a rival who was using a similar vaccine. In another case, however, Geison pointed to mitigating circumstances; Pasteur administered an untested vaccine, but did so to save a boy's life from rabies. Here, "he acted boldly and with humane courage. Do we really wish that he had acted otherwise?" asked Geison.

• In a session on "The Objectivity Crisis," anthropologist Marvin Harris (University of Florida) refuted the contentions of the postmodernism movement in the social sciences, which claims that ways of knowing are equally arbitrary, power dependent, and subjective. Said Harris: "We need more science, not less."

• Finally, in a session devoted to meta-analysis, psychologist Daryl Bem (Cornell) reviewed in detail 28 sets of ganzfeld ESP experiments of the late parapsychologist Charles Honorton. He concluded that, in his view, they provide the best evidence yet for the existence of extrasensory perception.

—*K.F.*

Pseudoscience . . . and Real Science on Stamps

Maldives's "Mysteries"

Maldives, a tiny Indian Ocean republic (population 226,000), is the latest country to issue postage stamps celebrating fringe-science topics. In the late 1970s, Grenada issued a set of stamps depicting UFOs, and recently Sierra Leone issued a stamp depicting "The 'Face' on Mars" (*SI*, Fall 1991). Now Maldives has issued a set of 16 stamps on "Mysteries of the Universe." Included are UFOs, crop circles, Yeti, the Loch Ness Monster, crystal skulls, and Atlantis. Each comes with its own souvenir sheet, but don't get too excited—each sheet costs $5 even though it contains only one stamp!

Fortunately, stamps celebrating real science far outnumber these occasional lapses into pseudoscience. There is a fine tradition of stamps

Real science on stamps: From Copernicus and von Kármán to the International Geophysical Year, "The Sciences," and Newton's theories.

honoring science and scientists. A current U.S. 29-cent commemorative, for example, honors aerospace scientist Theodore von Kármán, first winner of the U.S. National Medal of Science. Going back to the late 1950s, a 3-cent stamp celebrated the International Geophysical Year, an unprecedented worldwide research program. In 1963, on the hundredth anniversary of the U.S. National Academy of Sciences, a 5-cent stamp commemorated all "The Sciences." The U.S. has issued stamps honoring Copernicus (1973), Einstein twice (in 1966 and 1979), Joseph Priestley (1983), and Nobel laureate American physicist Robert Millikan (1982, a 37-cent stamp). In 1983 a four-panel set honored four pioneers of electrical engineering, including the genius theorist Charles Steinmetz. A 1976 13-cent stamp honored "Chemistry."

Stamps about space exploration are numerous worldwide, of course, and a few specifically honor space *science*, such as the "Understanding the Sun" and "Comprehending the Universe" stamps in the eight-stamp U.S. 1981 "Space Achievement" set. And a 1991 booklet of ten different 29-cent stamps features each of the nine planets and the moon.

Notable scientific phenomena have also been featured. Chile and Zambia were among the nations featuring Halley's Comet on stamps in 1986.

On rare occasions, stamps have even honored major scientific theories. In 1992, on the 350th anniversary of Sir Isaac Newton's birth, Great Britain issued stamps beautifully illustrating two of Newton's major contributions to science—his explanation of the "Motions of Bodies in Ellipses" and his "Opticks Treatise" on the refraction and reflection of light.

We'd be pleased to hear of other such examples.

—*Kendrick Frazier*

Werewolf in Mobile: Tracking a Hairy Story

As a longtime student of the tabloids, I'm used to seeing reports of vampires in Venezuela, space aliens in Borneo, and Elvis in Kalamazoo. So it was a rich surprise one day earlier this year when I picked up the *Weekly World News* (dated February 2, 1993) and discovered there was a werewolf downtown, right here in Mobile, Alabama, prowling the State Docks.

The report was written by Tim Skelly, identified as a "Special correspondent in Mobile, Ala." A small photo of Skelly appeared with the article.

The story was titled "Werewolf Battles Cops in Alabama," and the main facts were given in the opening paragraphs:

> MOBILE, Ala.—A howling, snarling werewolf escaped from a foreign freighter, savagely bit seven cops and turned a police cruiser over before he was captured in a darkened alley near the docks.
>
> Heavily armed police are now guarding the wolfman around the clock at an undisclosed location in Mobile County until he can be placed back aboard the ship he escaped from.

Much of this information came from "a police spokesman," who was quoted at length.

The most impressive evidence was photographic. There were four pictures:

- A profile of the creature's head, which took up most of one page of the two-page story. (He looks like Lon Chaney, Jr., in the Wolfman movies.) At the top of the picture is an identification

COPS IN ALAB
WEEKLY WORLD NEWS
WEREWOLF BATTLES COPS IN ALABAMA!
'I have never seen anything so frightening,' says housewife
BEHIND BARS: Hairy creature captured after vicious attack
Howling beast bites 7 officers – and turns over patrol car
...before he's finally captured!

number: "Mobile P.D. #702419 -92."

- A photo of Laura Schindler, a 58-year-old housewife, who stood five feet from the werewolf when he jumped off the ship. She is quoted as saying, "I never saw anything so frightening." Schindler had come to the State Docks to pick up her husband, a merchant seaman.
- A picture of an overturned car, with four wheels pointing in the air and with a spare tire stored under the trunk.
- A photo of a man with his entire head bandaged. Only his mouth is showing, and there are little slit spaces for his eyes. By the picture is a caption, "Ripped to Shreds."

The article fascinated me, and I was in a good position to check it out. Tom Jennings, who serves as Public Information Officer for the Mobile Police Department, is a former student of mine. So I phoned him to get the official version. Tom said, "We've had a lot of calls about that crazy story." Then he gave me the facts.

- The police department couldn't find any "police spokesman" who told the story to the *Weekly World News*.
- They couldn't identify a foreign freighter that had lost a deckhand.
- The "undisclosed location in Mobile County" where the wolf-man was being held remained undisclosed. Nobody in the department knew anything about it.
- The police had had no success in locating Laura Schindler. They could find no reference to her merchant-seaman husband.
- The identification number on the werewolf photo is not a sequence used by the Mobile Police Department.
- The police department had had no reports of an overturned vehicle, nor does it have a police cruiser that carries a spare tire under the car.
- There had been no injury reports relating to such an incident,

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Your bequest to CSICOP, Inc., will help to provide for the future of skepticism as it helps to keep the SKEPTICAL INQUIRER financially secure. Depending on your tax situation, a charitable bequest to CSICOP may have little impact on the net size of your estate—or may even result in a greater amount being available to your beneficiaries.

We would be happy to work with you and your attorney in the development of a will or estate plan that meets your wishes. A variety of arrangements are possible, including gifts of a fixed amount or a percentage of your estate; living trusts or gift annuities, which provide you with a lifetime income; or a contingent bequest that provides for the SKEPTICAL INQUIRER only if your primary beneficiaries do not survive you.

For more information, contact Paul Kurtz, Chairman of CSICOP. All inquiries will be held in the strictest confidence.

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certainly no report of a police officer "ripped to shreds."

Jennings was emphatic on the last two points. He said: "Around here, if an officer gets cut on the hand, there's a lot of paperwork that has to be filled out. If police property is destroyed, it's just the same. These are liability areas." He repeated that there were no reports relating to a werewolf incident. The article, he said, was a "total fabrication."

Jennings suggested I call Nancy Wilstach, a reporter for the *Birmingham News*. He said she had more information about the story.

Indeed she did. Wilstach had interviewed Eddie Clontz, editor of the *Weekly World News*. She found him pleasant and cooperative. He told her they got the werewolf report from Tim Skelly and that he considers Skelly a reliable source. He said, "Usually his stuff is right on the money."

According to Clontz, tabloids call these articles "harmless." They know that a werewolf story (or a vampire or space-alien story) won't offend anybody and won't bring a lawsuit. So the *Weekly World News* didn't try to verify the Mobile incident. They just got the report and published it. Clontz said, "We put it out there and let our readers decide."

He added, "Maybe it didn't happen."

Wilstach asked Clontz how she could get in touch with Tim Skelly. He told her it might be difficult, that Skelly is now doing research in Caracas, Venezuela. Clontz said. "He's covering our vampire beat."

—*Daniel McDonald*

Daniel McDonald is a professor in the Department of English, University of South Alabama, Mobile, AL 36688.

☐ *Where's the Rapture?*

In case you missed it, Wednesday, October 28, 1992, was the Rapture, the day faithful Christians dead or alive ascend to heaven. The Rapture kicks off the last days: the appearance of the Antichrist, Armageddon, and the Second Coming.

Lee Jang Rim, leader of the Dami Mission Church in Seoul, South Korea, spread the prophecy. Followers quit their jobs and sold or destroyed their property in anticipation, even as Rim was arrested for allegedly bilking hundreds of thousands of dollars from church members. The hysteria created a near crisis in South Korea.

Members of Korean churches in South Korea, Hawaii, Los Angeles, and New York held marathon prayer vigils. Four suicides in the Seoul church led some Los Angeles reporters to think another Jonestown was at hand, but nothing happened. There was no Rapture, and everyone went home.

On November 3, the *Los Angeles Times* reported that the Dami Mission Church was disbanded with the approval of Rim, still in jail, and that an apology had been issued. On December 5, the Associated Press carried the news that Rim had been sentenced to two years imprisonment for having shorn his flock of $4.4 million, much of it invested in bonds that matured after December 28.

Meanwhile, Jack Van Impe, of Jack Van Impe Ministries out of Troy, Michigan, has been prophesying that the Rapture will occur in October, perhaps as early as this year. Stay tuned.

—*Erik Vaughn*

Erik Vaughn writes from Huntington Beach, California.

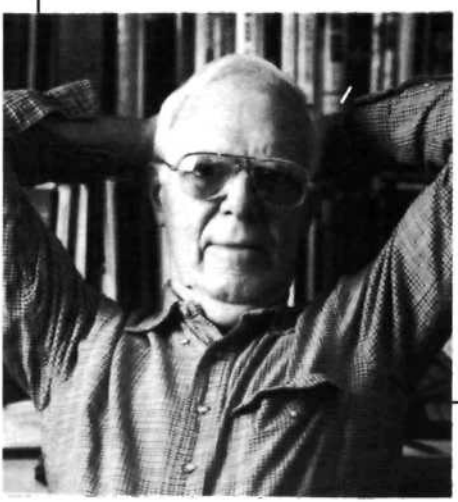
"Crank science books far outsell most books by reputable scientists."

I wrote the words above way back in 1981, in my book *Science: Good, Bad and Bogus.* I think they are still true.

The book is a collection of essays, many of them culled from the pages of the SKEPTICAL INQUIRER. There I dealt with ESP, biorhythms, psychics, and dozens of other fringe-science phenomena.

That was then. This is now. Hardly anyone takes biorhythms, ancient astronauts, or the Bermuda Triangle seriously anymore. I expect that this is at least partly because the SKEPTICAL INQUIRER and its parent, CSICOP, have been doing their work.

Psychics? We have lots more to do there. But we need to work from a position of strength. That's where the Center for Inquiry comes in. The Center, in Amherst, New York (a suburb of Buffalo, 60 miles from Rochester, 80 miles from Toronto, an hour by air from New York City, five hours from California), will be able to dedicate these fea-



Martin Gardner,
co-chairman of CSICOP's
"Price of Reason" Campaign

tures to the skeptical movement:

1. **The world's largest skeptics' library**

2. **Our own seminar, meeting, and conference rooms**

3. **Our own video and audio production center**

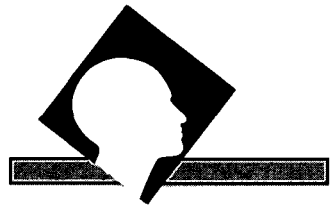
The new facility will provide 25,000 square feet of space, a tenth of a mile from the Amherst Campus of the State University of New York at Buffalo, the largest campus of the country's largest state university system.

Price: $3.96 million in donated capital. I am proud to be co-chairman of this effort with Steve Allen. We have both given to it. But we can't accomplish our goals without your participation, too.

Please use the postpaid response card in this issue, and let us know how you would like to help out.

Martin Gardner

Notes of a Fringe-Watcher



MARTIN GARDNER

The False Memory Syndrome

In March 1992, a group of distinguished psychologists and psychiatrists, including CSICOP's Ray Hyman, banded together to form the False Memory Syndrome (FMS) Foundation. The organization is headquartered in Philadelphia under the direction of educator Pamela Freyd. Its purpose: to combat a fast-growing epidemic of dubious therapy that is ripping thousands of families apart, scarring patients for life, and breaking the hearts of innocent parents and other relatives. It is, in fact, the mental-health crisis of the 1990s.

The tragic story begins with Freud. Early in his career, when he made extensive use of hypnotism, Freud was amazed by the number of mesmerized women who dredged up childhood memories of being raped by their fathers. It was years before he became convinced that most of these women were fantasizing. Other analysts and psychiatrists agreed. For more than half a century the extent of incestuous child abuse was minimized. Not until about 1980 did the pendulum start to swing the other way as more solid evidence of child sexual abuse began to surface. There is now no longer any doubt that such incest is much more prevalent than the older Freud or the general public realized.

Then in the latter 1980s a bizarre therapeutic fad began to emerge in the United States. Hundreds of poorly trained therapists, calling themselves "traumatists," began to practice the very techniques Freud had discarded. All over the land they are putting patients under hypnosis and subtly prodding them into recalling childhood sexual traumas, memories of which presumably have been totally obliterated for decades. Decades Delayed Disclosure, or DDD, it has been called. Eighty percent of the patients who are claimed to experience DDD are women from 25 to 45 years old. Sixty percent of their parents are college graduates, 25 percent with advanced degrees. More than 80 percent of their parents are married to their first spouse.

Here is a typical scenario. A woman in her thirties seeks therapy for symptoms ranging from mild depression, anxiety, headaches, or the inability to lose weight, to more severe symptoms like anorexia. Her therapist, having succumbed to the latest mental-health fad, decides almost at once that the symptoms are caused by repressed memories of childhood abuse. Profoundly shocked by this suggestion, the woman vigorously denies that such a thing could be possible. The stronger her denial, the

more the therapist believes she is repressing painful memories.

The patient may be hypnotized, or given sodium amytal, or placed into a relaxed, trancelike state. Convinced that a childhood trauma is at the root of the patient's ills, the therapist repeatedly urges the woman to try to remember the trauma. If she is highly suggestible and eager to please the therapist, she begins to respond to leading questions and to less obvious signs of the therapist's expectations.

After months, or even years, images begin to form in the patient's mind. Shadowy figures threaten her sexually. Under continual urging, these memories grow more vivid. She begins to recognize the molester as her father, or grandfather, or uncle. The more detailed the visions, the more convinced both she and the therapist become that the terrible truth is finally being brought to consciousness. To better-trained psychiatrists, these details indicate just the opposite. Childhood memories are notoriously vague. Recalling minute details is a strong sign of fantasizing.

As the false memories become more convincing, the patient's anger toward a once-loved relative grows. The therapist urges her to vent this rage, to confront the perpetrator, even to sue for psychic damage. Stunned by their daughter's accusations, the parents vigorously deny everything. Of course they will deny it, says the therapist, perhaps even suppress their own memories of what happened. The family is devastated. A loving daughter has inexplicably been transformed into a bitter enemy. She may join an "incest survivor" group, where her beliefs are reinforced by hearing similar tales. She may wear a sweatshirt saying, "I survived."

No one doubts that childhood sexual assaults occur, but in almost every case the event is never forgotten. Indeed, it festers as a lifelong source of shame and anger. Studies show that among children who witnessed the murder of a parent, not a single one repressed the terrible memory. Not only do victims of child incest not repress such painful memories (to repress a memory means to completely forget the experience without any conscious effort to do so); they try unsuccessfully to forget them. That traumas experienced as a child can be totally forgotten for decades is the great mental-health myth of our time—a myth that is not only devastating innocent families but doing enormous damage to psychiatry.

In the past, when juries found a parent guilty of child incest, there has been corroborating evidence: photos, diaries, letters, testimony by others, a history of sexual misconduct, or even open admission of guilt. Juries today are increasingly more often judging a parent guilty without any confirming evidence other than the therapy-induced memories of the "victim."

Patients as well as their families can be scarred for life. They are led to believe that bringing suppressed memories to light will banish their symptoms. On the contrary, the symptoms usually get worse because of traumatic breaks with loved ones. Moreover, this treatment can also cause a patient to refuse needed therapy from psychiatrists who have not fallen prey to the FMS epidemic. Pamela Freyd has likened the traumatists to surgeons doing brain surgery with a knife and fork. Others see the epidemic as similar in many ways to the great witch-hunts of the past, when disturbed women were made to believe they were in Satan's grip. The Devil has been replaced by the evil parent.

FMS takes many forms other than

parental sexual abuse. Thousands of victims are being induced by traumatists to recall childhood participation in satanic cults that murder babies, eat their flesh, and practice even more revolting rituals. Although there is widespread fascination with the occult, and an amusing upsurge in the number of persons who fancy themselves benevolent witches or warlocks, police have yet to uncover any compelling evidence that satanic cults exist. Yet under hypnosis and soporific drugs, memories of witnessing such rituals can become as vivid as memories of sexual abuse.

Thousands of other patients, highly suggestible while half asleep, are now "remembering" how they were abducted, and sometimes sexually abused, by aliens in spaceships from faraway planets. Every year or so victims of this form of FMS (assuming they are not charlatans) will write persuasive books about their adventures with extraterrestrials. The books will be heavily advertised and promoted on talk shows, and millions of dollars will flow into the pockets of the authors and the books' uncaring publishers. Still another popular form of FMS, sparked by the New Age obsession with reincarnation, is the recovering of memories of past lives.

Pop-psychology books touting the myth that memories of childhood molestations can be suppressed for decades are becoming as plentiful as books about reincarnation, satanic cults, and flying saucers. Far and away the worst offender is a best-seller titled *Courage to Heal* (Harper & Row, 1988), by Ellen Bass and Laura Davis. Although neither author has had any training in psychiatry, the book has become a bible for women convinced they are incest survivors. Davis thinks she herself is a survivor, having recalled under therapy being attacked by her grandfather. A survey of several hundred accused parents revealed that in almost every case their daughters had been strongly influenced by *Courage to Heal.* (See box for some of the book's more outrageous passages.)

From the growing literature of FMS cases I cite a few typical horrors. A 28-year-old woman accuses her father of molesting her when she was six months old. "I recall my father put his penis near my face and rubbed it on my face and mouth." There is not the slightest evidence that a child of six months can acquire lasting memories of *any* event.

Betsy Petersen, in *Dancing with Daddy* (Bantam, 1991) tells of being convinced by her therapist that she had been raped by her father when she was three. "I don't know if I made it up or not," she told the therapist. "It feels like a story," he replied, "because when something like that happens, everyone acts like it didn't."

In 1986 Patti Barton sued her father for sexually abusing her when she was seven to fifteen months old. She did not remember this until her thirty-second therapy session. She recalls trying to tell her mother what happened by saying, "Ma, ma, ma, ma!" and "Da, da, da, da!"

Geraldo Rivera, in 1991, had three trauma survivors on his "Geraldo" television show. One woman insisted she had murdered 40 children while she was in a satanic cult but had totally forgotten about it until her memories were aroused in therapy. Well-known entertainers have boosted the FMS epidemic by openly discussing their traumas on similar sensational talk shows. Roseanne Barr recently learned for the first time, while in therapy, that she had been repeatedly molested by her parents, starting when she was three months old! Her story made the cover of *People* magazine. Barr's parents and sisters deny

Passages from *Courage to Heal*, the "Bible" of Incest Survivors

"You may think you don't have memories, but often as you begin to talk about what you do remember, there emerges a constellation of feelings, reactions and recollections that add up to substantial information. To say, 'I was abused,' you don't need the kind of recall that would stand up in a court of law. Often the knowledge that you were abused starts with a tiny feeling, an intuition. . . . Assume your feelings are valid. . . . If you think you were abused and your life shows the symptoms, then you were."

"If you don't remember your abuse you are not alone. Many women don't have memories, and some never get memories. This doesn't mean they weren't abused."

"If you maintained the fantasy that your childhood was 'happy,' then you have to grieve for the childhood you thought you had. . . . You must give up the idea that your parents had your best interest at heart. . . . If you have any loving feelings toward your abuser, you must reconcile that love with the fact that he abused you. . . . You may have to grieve over the fact that you don't have an extended family for your children, that you'll never receive an inheritance, that you don't have family roots."

"If your memories of the abuse are still fuzzy, it is important to realize that you may be grilled for details. . . . Of course such demands for proof are unreasonable. You are not responsible for proving that you were abused."

"If you're willing to get angry and the anger just doesn't seem to come, there are many ways to get in touch with it. A little like priming the pump, you can do things that will get your anger started. Then once you get the hang of it, it'll begin to flow on its own."

"You may dream of murder or castration. It can be pleasurable to fantasize such scenes in vivid detail. . . . Let yourself imagine it to your heart's content."

it and have threatened legal action. A former Miss America, Marilyn Van Derbur, has been in the news proclaiming her decades-delayed recollection of abuse by her father, now deceased.

It is an alarming trend that a dozen states have revised their statute-of-limitations laws and now permit legal action against parents within three years of the time the abuse was *remembered!* In 1990 the first conviction based on "repressed memory" occurred. George Franklin was given a life sentence for murdering an 8-year-old in 1969 almost entirely on the basis of his daughter's memory, allegedly repressed for 20 years, of having witnessed his murdering her friend. A year later a Pennsylvania

man was convicted of murder on the basis of a man's detailed account of what he had seen when he was five, but had totally forgotten for 16 years.

Although therapists usually deny asking leading questions, tapes of their sessions often prove otherwise. If no memories surface they will prod a patient to make up a story. After many repetitions and elaborations of the invented scenario, the patient starts to believe the story is true. One therapist, who claims to have treated 1,500 incest victims, explained her approach. She would say to a patient: "You know, in my experience, a lot of people who are struggling with many of the same problems you are have often had some kind of really painful things happen to them as kids—maybe they were beaten or molested. And I wonder if anything like that ever happened to you?" Another traumatist says: "You sound to me like the sort of person who must have been sexually abused. Tell me what that bastard did to you."

The FMS epidemic would not be so bad if such therapists were frauds interested only in money, but the sad truth is that they are sincere. So were the doctors who once tried to cure patients by bleeding, and the churchmen who "cured" witches by torture, hanging, and burning.

Better-trained, older psychiatrists do not believe that childhood memories of traumas can be repressed for any length of time, except in rare cases of actual brain damage. Nor is there any evidence that hypnosis improves memory. It may increase certitude, but not accuracy. And there is abundant evidence that totally false memories are easily aroused in the mind of a suggestible patient.

A two-part article by Lawrence Wright, "Remembering Satan" (*New Yorker*, May 17 and 24, 1993), tells the tragic story of Paul Ingram, a respected police officer in Olympia, Washington, who was accused by his two adult daughters of sexually abusing them as children. Ingram's family are devout Pentecostals who believe that Satan can wipe out all memories of such crimes. Ingram remembered nothing, but after five months of intensive questioning, he came to believe himself guilty. Psychologist Richard Ofshe, writing on "Inadvertent Hypnosis During Interrogation" (*International Journal of Clinical and Experimental Hypnosis*, 11:125-155, 1992), tells how he fabricated an imaginary incident of Ingram's sexual abuse of a son and daughter. After repeated suggestions that he try to "see" this happening, Ingram produced a written confession!

Jean Piaget, the Swiss psychologist, tells of his vivid memory of an attempted kidnapping when he was two. The thief had been foiled by Piaget's nurse, who bravely fought off the man. When Piaget was in his teens the nurse confessed that she made up the story to win admiration, even scratching herself to prove there had been a struggle. Piaget had heard the story so often that it seeped into his consciousness as a detailed memory.

Paul McHugh, a psychiatrist at Johns Hopkins University, in "Psychiatric Misadventures" (*American Scholar*, Fall 1992), writes about a woman who under therapy came to believe she had been sexually assaulted by an uncle. She recalled the exact date. Her disbelieving mother discovered that at that time her brother was in military service in Korea. Did this alter the woman's belief? Not much. "I see, Mother," she said. "Yes. Well let me think. If your dates are right, I suppose it must have been Dad."

Although the incest-recall industry is likely to grow in coming years, as it spreads around the world, there are some hopeful signs. Here and there

women are beginning to discover how cruelly they have been deceived and are suing therapists for inducing false memories that caused them and their parents great suffering. They are known as "recanters" or "retractors."

Another welcome trend is that distinguished psychologists and psychiatrists are now writing papers about the FMS epidemic. I particularly recommend the book *Confabulations* (Social Issues Research Series, Boca Raton, Fla., 1992) by Eleanor Goldstein, and the following three articles: "Beware the Incest-Survivor Machine," by psychologist Carol Tavris, in the *New York Times Book Review* (January 3, 1993); "The Reality of Repressed Memories," by Elizabeth Loftus (psychologist, University of Washington), scheduled for publication in *American Psychologist*, and "Making Monsters," by Richard Ofshe and Ethan Watters, in *Society* (March 1993). Most of this column is based on material in those articles. Copies can be obtained, along with other literature, from the FMS Foundation, 3401 Market Street, Philadelphia, PA 19104. The phone number is 215-387-1865, Fax: 215-387-1917.

The FMS Foundation is a nonprofit organization whose purpose is to seek reasons for the FMS epidemic, to work for the prevention of new cases, and to aid victims. By the end of 1992, only ten months after its founding, more than two thousand distressed parents had contacted the Foundation for advice on how to cope with sudden attacks by angry daughters who had accused them of horrible crimes.

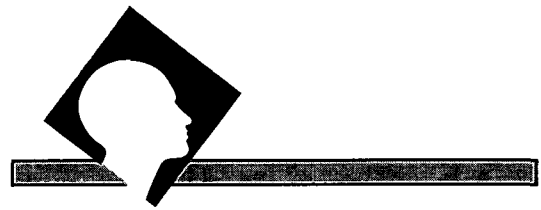
I trust that no one reading this column will get the impression that either I or members of the FMS Foundation are not fully aware that many women are indeed sexually abused as children and that their abusers should be punished. In its newsletter of January 8, 1993, the Foundation responded to criticism that somehow its efforts are a backlash against feminism. Their reply: Is it not "harmful to feminism to portray women as having minds closed to scientific information and as being satisfied with sloppy, inaccurate statistics? Could it be viewed as a profound insult to women to give them slogans rather than accurate information about how memory works?"

The point is not to deny that hideous sexual abuse of children occurs, but that, when it does, it is not forgotten and only "remembered" decades later under hypnosis. Something is radically amiss when therapist E. Sue Blume, in her book *Secret Survivors*, can maintain: "Incest is easily the greatest underlying reason why women seek therapy. . . . It is my experience that fewer than half of the women who experience this trauma later remember or identify it as abuse. Therefore it is not unreasonable that *more than half of all women* are survivors of childhood sexual trauma."

As Carol Tavris, author of *Mismeasure of Women*, comments in her article cited above: "Not one of these assertions is supported by empirical evidence."

This marks the beginning of Martin Gardner's second decade as a regular SKEPTICAL INQUIRER *columnist. His first column, "Lessons of a Landmark PK Hoax," appeared in our Summer 1983 issue. Many of his columns have been reprinted (often with postscripts) in his books* The New Age *(Prometheus, 1988, 1991) and* On the Wild Side *(Prometheus, 1992). Some appear in the* SI *anthologies* Science Confronts the Paranormal *(Prometheus, 1986) and* The Hundredth Monkey and Other Paradigms of the Paranormal *(Prometheus, 1991).*

Psychic Vibrations



Quatrain X, Satanic Cults, and STS-48's Crystals

ROBERT SHEAFFER

I write these words with trepidation, knowing that they could be among my last. According to Nostradamus experts Peter Lorie and V. J. Jewitt, the massively destructive California earthquake all the seers have been warning about will occur at 7:05 P.M. on May 8, 1993. If they are correct, by the time you read this, I'll probably be dead. Lorie stated on the Fox TV program "Sightings," aired on January 8, that on May 8 "there will be one of the largest earthquakes ever to hit California," lasting 11 minutes and resulting in "a major disaster on the American continent."

Lorie and Jewitt's book, *Nostradamus, the End of the Millennium, Prophecies: 1992 to 2001*, explains how Nostradamus's Quatrain X, verse 74, foretells that in 1992-93 "the coronation of King Charles and the Olympic games will be followed by a great earthquake triggered off by a shifting of the sea." But, you may object, this quatrain says nothing about any King Charles, or the Olympics, or the San Andreas Fault. And you are correct: it contains a murky and ominous prediction about how the year of "the seventh number" around the "millennial age" will see some kind of slaughter and the dead rising from their tombs. However, Lorie explains that "what we did in our book was to actually discover a code, a numerical and grammatical code, which actually is quite tricky to begin with, but once you get the hang of it it's quite simple, which decodes the quatrains and makes them much more fascinating than they are in fact on the face of it." So the authors have found a clever way to actually *improve upon* the prophecies of Nostradamus, making them more interesting and up to date.

* * *

How can it be that, during a time when churches report declining attendance, the membership of supposed satanic cults seems to be positively booming? *Ms.* magazine published in its January 1993 issue an article purporting to be "a first-person account of cult ritual abuse." The pseudonymous author claims not only to have been repeatedly abused during her childhood by her family's multigenerational satanic cult, but to have witnessed the ritual slaughter of her infant sister, who was then cannibalized by the otherwise ordinary middle-class people in the cult. She claims her uncle explained: "Babies deserve to die. Satan wants their blood, especially girl babies, because they taste so good." She says only female infants were sacrificed. When her mother's pregnancy was

seven months along, the cult somehow "decided she was carrying a girl child." (This was before modern medical techniques were available for determining the sex of a fetus.) How do members of cults like these avoid being charged with murder? It is said that the cult's doctor induces early labor in the mother; hence neither the baby's birth nor its death is recorded. Apparently no notice is taken by the outside world of thousands of women who are seven months pregnant, then suddenly pregnant no more. "If we want to stop ritual abuse," the author concludes, "the first step must be to believe that these brutal crimes occur." To doubt these "survivor" stories causes the women to be "revictimized because people cannot face the truth."

Meanwhile, the *Cleveland Plain Dealer* reported on January 28 that a woman was awarded a $10-million default judgment against her father and other men who she claims ritually abused her as a child. According to the *Plain Dealer*, Jamie Ann Sitko claims that she "vividly recalled incidents which involved men, including her father, standing in a circle around a fire with hoods, cat's blood, live cats, dead cats, candles, chants and threats of violence, to force her compliance."

The source of satanic-cult information most strongly recommended by the author of the *Ms.* article is the Los Angeles County Commission for Women's Ritual Abuse Task Force, which at the time the article appeared was making headlines of its own. The *Los Angeles Times* reported last December 1 that Task Force members were again repeating their "longstanding claim that satanists are poisoning them and other satanic abuse survivors—and their therapists—by exposing them to a toxic pesticide pumped into their offices, homes, and cars." Task force members claim that as many

as 43 people are being slowly poisoned with the pesticide diazanon, although no real evidence of this has been presented. Los Angeles County's chief toxicologist, Paul J. Papanek, said, "I can't believe I'm sitting here listening to this." While diazanon is quite effective when sprinkled directly on anthills, to attempt to poison people by pumping minute traces into their offices must rank as one of the least effective murder plots yet devised. Apparently the satanic cults, which allegedly commit thousands of murders yearly without being apprehended, are nonetheless so inept as to be unable to choose an effective poison to do away with 43 of their most dangerous critics.

* * *

When on June 5, 1992, the syndicated "infotainment" TV show "Hard Copy" ran a short segment of NASA video

showing a few specks of light go floating by, nobody could have imagined the fuss it would eventually cause. A UFO buff, who originally taped the video from the NASA Select cable channel during the September 1991 mission of the space shuttle *Discovery*, STS-48, sent it to the "Hard Copy" show. During shuttle missions, while the crew is asleep, NASA often leaves the cameras in the cargo bay pointing at the earth, with the video being rebroadcast to the public in real time. It has been known since the earliest space missions that spacecraft in orbit are typically surrounded by swarms of ice particles and other small pieces of debris that not infrequently will float in front of the cameras. But what makes the STS-48 video seem remarkable is a bright flash at the corner of the screen, and one of the floating objects soon goes scurrying away in a dramatic reversal of its original path. Don Ecker, editor of *UFO Magazine*, told "Hard Copy" that the object appeared to make a right-angle turn to avoid getting shot at. NASA officials said that all of the objects were ice crystals drifting in front of the camera, but UFOlogists objected that drifting ice crystals can't suddenly change direction.

The video was shown again on CNN's "Larry King Live" three weeks later, with CSICOP Fellow James E. Oberg debating Ecker. Oberg explained that the flash seen in the sequence was simply the brief firing of a jet from the shuttle's Reaction Control System, operating under computer control. A few moments later, the thrust of the firing reaches the closest ice particle, knocking it from its previous path. Ecker refused to accept this explanation, insisting that the objects are large and quite far away and that NASA must be covering up some kind of dramatic event.

At present, many UFOlogists continue to insist that this is the case. Recently Richard Hoagland, one of the principal promoters of the "Face on Mars," produced an analysis insisting that the video clip must have captured a super-secret test of a Star Wars missile defense. He claims that the object that changes direction first appears from beyond the horizon, 1,713 miles away, moving at incredible velocity. The flash, he insists, must be due to an "electromagnetic pulse effect" induced in the camera. Oberg, however, counters that the ice particle was no more than a few feet away and simply drifted into sunlight from the orbiter's shadow. Many UFO believers refused to accept this and insist that Oberg must be part of a NASA "cover-up" and "disinformation" campaign. The STS-48 "space UFO" seems to have entered the folklore of UFOlogy. □

The Vigorous Debate of Science

Science . . . looks skeptically at all claims to knowledge, old and new. It teaches not blind obedience to those in authority but vigorous debate, and in many respects that's the secret of its success.

—Carl Sagan, at the national meeting of the American Astronomical Society, Phoenix, January 5, 1993.

A CSICOP SEMINAR

The Skeptic's Toolbox II

University of Oregon at Eugene
Thursday-Monday, August 19-23

The workshop will begin with dinner and an introduction on Thursday night, August 19, and will adjourn at noon on Monday. Our goal is to sharpen the ability of skeptics to deal with various situations. Some of the topics to be covered by the five lecturers are:

Model Cases: Critical Investigations and How to Adapt Them to Related Claims

Cults: New Insights and Techniques for Resisting Mind Control and Manipulation

The Munchausen Syndrome: How to Detect False Claims of Illness

Ideomotor Actions: Clever Hans, Dowsing, the Ouija Board, etc.

Graphology: The Use of Handwriting Analysis to Predict Personality Traits

The Oregon Vortex (video footage), the Bermuda Triangle, Crop Circles, and Other Physical Phenomena

Ray Hyman, the workshop coordinator, is a professor of psychology at the University of Oregon and a member of the CSICOP Executive Council. He has written extensively on the critical evaluation of paranormal claims. With a background in professional magic, he specializes in the psychology of human error and deception.

Barry Beyerstein, professor of psychology at Simon Fraser University, Vancouver, B.C., and a member of the CSICOP Executive Council, specializes in how the brain determines behavior. He has researched how apparently psychic experiences can be due to malfunctions in the brain.

Loren Pankratz, a clinical psychologist with the Veterans Administration in Portland, Oregon, is the world's foremost authority on the Munchausen Syndrome, which refers to patients who repeatedly and successfully fake serious illnesses. He has studied quackery in all its guises, and is a magician who writes on the psychology of conjuring.

Bob Fellows, who has a degree from Harvard in theological studies, is a professional mentalist and illusionist. He is an educational consultant to the International Cult Education Program.

Jerry Andrus, magician, inventor, and iconoclast, has lectured at Harvard, MIT, the University of Oregon, and elsewhere on how people reach the wrong conclusions for the "right" reasons. He has created many optical illusions and is a consultant to major science museums.

For registration information, contact:

Barry Karr, CSICOP, P.O. Box 703, Buffalo, NY 14226-0703, or call him at 716-636-1425.

The Right Hemisphere: An Esoteric Closet?

FERNANDO D. SARAVI

It is generally agreed that the highest level of neural processing and the main anatomical substrate of higher nervous functions reside in the cerebral hemispheres, particularly in their external layer, i.e., the cerebral cortex. The cortex of the human brain, responsible for 40 percent of the weight of the organ (Barr 1973: 201), has an average surface area of 2.5 square feet, and its nerve cells, or neurons, number about 14 billion (Carpenter 1979: 280).

The right brain is mystical and under-used, right? Think again!

The right and left brain hemispheres (halves) are anatomically and functionally interconnected by some 800 million fibers, most of them belonging to the corpus callosum. These fibers reciprocally connect homologous areas of the hemispheres, thus providing a two-way path for the integrated function of the normal brain (Trevarthen 1990).

One of the favorite themes of pseudoscientific lore is that most of us employ just a tiny fraction of the intrinsically unlimited potential of our brains (Beyerstein 1987-88). A common subtheme is related to the function of the hemispheres. The left half of the brain is depicted as analytical, scientifically biased, and rational. The right hemisphere, on the other hand, is thought of as creative, intuitive, mystical, and, to use a pet word of New Agers, holistic. We are told that if we just learn to use this magical side of our brain, our mental power would be multiplied. For example, a New Age magazine says:

> Deprecated by scientists that regard it as the useless part of our brain, during the last decade the right hemisphere has shown itself to be more important than [formerly] believed. In

it reside creativity, originality and artistic skills. Now mechanisms are studied and exercises are programmed to stimulate the right brain, which in most human beings is sleeping. . . .

Until now, our left brain has not been taught to show respect for the right brain. But in the last ten years . . . the right brain, which retrieves the cosmic wisdom of mysticism, has won for itself an immense intellectual respect, because it is [now] believed that all the new, the innovative, the original, is generated there. (Hormaechea 1990: 66, 68).

In this article I review available evidence showing that this "mystical right-brain underuse" idea is just another pseudoscientific myth by which from the brick of facts a huge shrine of fallacies is built. That building is founded on outdated concepts and on a biased interpretation of evidence.

Cerebral Dominance: A Classical View

During the last century, first Broca and then Wernicke correctly located those brain cortical areas related to speech understanding and production. Their studies were based on a systematic comparison of the handicaps resulting from localized brain lesions. Both scientists indicated with remarkable accuracy which cortical areas were typically affected in several speech disorders. In over 95 percent of cases, the lesion was located in the left hemisphere (Geschwind 1980; Hécaen 1977; Luria 1980).

It was also recognized that about 90 percent of individuals use preferentially the right hand for unimanual tasks. As the motor pathways are mainly crossed, the right hand is controlled by the left hemisphere. Thus, at the turn of the century clinical evidence showed that the left half of the brain normally surpassed the right one as far as speech and hand control were concerned. Since language comprehension and production was deemed paramount for thought processes, for a time it was believed that the contribution of the right hemisphere to these processes was marginal. This gave place to the misleading labeling of the right half as the minor hemisphere, and of the left one as the major, or dominant, hemisphere.

Dominance Revisited

As neuroscience advanced, the classical view of dominance had to be reviewed in the light of new data obtained by researchers, among them Norman Geschwind, Michael Gazzaniga, and Roger Sperry. The latter was the head of a research team at Caltech, whose work during the sixties greatly enlarged our understanding of hemispheric function. Sperry's work was acknowledged with several awards, including a Nobel Prize in Physiology and Medicine (see Sperry 1982).

When Sperry began his studies of human patients, he already had considerable experience in hemispheric specialization in animals. However, for obvious reasons, data derived from research in animals could give but little insight into such functions as abstract reasoning, speech, and emotions. Although patients with unilateral brain lesions had provided interesting data, the conclusions derived from this source were necessarily tentative.

Sperry and his collaborators had a golden opportunity for studying several patients in which the hemispheric commisures had to be severed as a last resource for controlling intractable epileptic seizures. The operation suppressed all direct con-

nections between the hemispheres. Then investigators developed ingenious techniques for the selective study of either half of the bisected brain; thus, right and left performance could be assessed separately in the same patient. Although there were doubts about whether results obtained from epileptic patients could be extrapolated to the normal human brain, newer techniques allowed researchers to essentially confirm the initial results, in normal volunteers.

I will not discuss here the experimental techniques that the interested reader will easily find in the references. Instead, I will review the results and their relevance for our understanding of brain functions. I will also draw on observations made in patients with unilateral brain lesions, because this is still an important source of knowledge. The harmonious picture that emerges from these studies has nothing to do with the claims of neuropsychoquackery.

Dominance or Difference?

A most important conclusion derived from the study of commisurotomized, or "split brain," patients is that there are no firm bases for regarding the left hemisphere as dominant for every higher function. Normally both halves work in an integrated, coordinated way. Each half masters certain functions and controls those functions better than the other. This fact is best described by the term *laterality* than by the former word, *dominance*. Thus today it is confusing to speak of "dominance," except with reference to speech and handedness (Ruch 1979:217f.).

Experimental and clinical evidence strongly suggests that the left hemisphere excels in tasks related to verbal language, arithmetic reasoning, sequential (time-linked) processing, and analytical abilities at large. On the other hand, the right hemisphere does better than the left in geometrical tasks, face recognition, nonverbal and paraverbal communication, among others. The lateralization of functions is schematically depicted in the table. As this paper deals primarily with right hemispheric function, this will be discussed at some length.

Functions Lateralized to the Right Hemisphere

Spatial perception. The right hemisphere performs better than the left one in most geometrical and spatial perception tests, e.g., estimating the size of a circumference from its arc, filling complex matrices from a partial view, making bi- and tri-dimensional correlations like pointing out how a bi-dimensionally developed body would look in space. Also, it has to do with the body scheme, as patients with right-sided lesions may suffer disorders like neglect or even denial of the left side of their bodies, and also deficits in tasks requiring a well-developed spatial sense (Damasio and Tranel 1991).

Face recognition. Some patients with right cortical lesions show *prosopagnosia*, an inability to recognize faces, even those of close relatives or their own faces (Damasio, Tranel, and Damasio 1990). To recognize a face among others is a very complex, right lateralized function. Usually we can recognize thousands of faces, even from different viewpoints. Patients with prosopagnosia must resort to clues like eyeglasses, hair style, moustache, or voice for recognition. In face recognition, certainly "a picture is worth a thousand words." Using the analytical cognitive style of the left hemisphere, it is an impossible task to describe a face in detail, so as to make it unequivocally recognizable.

Orientation in space. Finding the way home, going to our work, or locating a place from a map are right lateralized functions. Patients with right-sided lesions must often employ alternative, less efficient strategies to arrive at a desired place, such as counting the blocks, reading the streets' names and numbers, and remembering a verbal description of the building that is being looked for.

Affective aspects of speech. Against what was formerly believed, the normal right hemisphere has an ability for the comprehension of written and spoken language. For example, it can identify single words and even recognize by touch a word in relief, through the left hand. A more important role for the right half of the brain in human communication, however, is the per-

ception of the affective components of spoken language (Ross 1984). Lack of perception of these components of language makes it impossible to discern between an assertion and an irony, or between anger and joy. Everyday experience shows that the way words are spoken is often more important than the words themselves.

An uncommon result of right-sided lesions is *aprosody*, an inability to give affectively appropriate intonation to speech. It seems that aprosodic patients do not lack affectivity (indeed, they may report very strong emotions); however, they cannot express their feelings verbally, and their monotonous speech may be mistaken for a flat affectivity.

Nonverbal communication. The perception and interpretation of the language of gestures also appears to be a right lateralized function (Bear 1983; Ross 1984). The right hemisphere is also important for the production of this kind of nonverbal language.

Affectivity. Consistent with its role in the interpretation and production of affective components of verbal and nonverbal communication, the right hemisphere has also been implicated in the neurology of emotion at the cortical level (Bear 1983). The selective anesthesia of either hemisphere through the Wada test (which involves the injection of a short acting anesthetic through the carotid artery), as well as other studies, suggests that the right half of the brain has to do with feelings of grief and fear. In contrast, the left hemisphere seems to be emotionally neuter, or euphoric. It has long been observed that patients with right cortical lesions may show a denial of their illness, or *anosognosia*, which may be in part the result of a blunted emotional response (Bear 1983).

Control of selective attention. The neurological function called "attention" is an extremely complex one, and its study began at a relatively recent date. However, there is evidence pointing to a role of the right hemisphere in the cortical control of attention to external stimuli. This is suggested both by clinical observations in patients with right-sided lesions and by physiological studies that show a functional activation of right cortical areas during attention tasks (Posner and Petersen 1990). On the other hand, the left hemisphere may be relatively inattentive to external stimuli but important for introspection (Bear 1983). If introspection is one of the key features of mystical experiences, it could be speculated that the left hemisphere, rather than the right one, should play a dominant role with regard to inner states.

Musical perception. The study of lateralization of this complex function has yielded conflicting results. However, it seems that certain aspects of musical perception are indeed lateralized to the right; for example, harmonic perception as tested by the detection of complex relationships among simultaneous musical sounds (Tramo and Bharucha 1991).

Complementarity and Creativity

Recent research has brought a clearer comprehension of brain function and hemispheric specialization. Each half of the brain is the functional complement of the other. Thus, the hemispheres do not seem to behave as master and slave, but as partners, each of which subserves certain functions better than the other.

Of course laterality should not be overemphasized, since each hemisphere has limited abilities for functions in which the other side normally excels. For example, it has already been noted that the normal right hemisphere has a degree of

TABLE 1: Functional Complementarity Between the Cerebral Hemispheres (schematic; see text)

Left Hemisphere	Right Hemisphere
Temporal	Spatial
Verbal memory	Memory for shapes
Analytic	Perception of wholes*
Arithmetic	Geometric
Sequential motor coordination	Schemata, body image
Spoken and written language	Face recognition
	Prosody and nonverbal communication
Cognitive, neutral	Affective, emotional
Introspective	Environmentally oriented
Reflexive	Impulsive

* I deliberately avoid the adjective "holistic" because of its connotations, as described in the following definition: "based on the principle that a whole thing is more than just a collection of parts added together" (Longman 1987: 501).

speech comprehension, and it may be added that the left hemisphere could have a role in spatial perception (Mehta and Newcombe 1991). Probably the full potential of each half for functions normally contralaterally controlled may only be expressed when the other side of the brain is damaged.

In any event, it is clear that the discovery of anatomical asymmetries (not to be discussed here; see, e.g., Bradshaw 1978) and functional differences between both hemispheres has elicited much speculation. Some of these are reasonable, educated guesses, whereas others are fancies having no support whatsoever from available evidence. In 1984 Sperry wrote:

> One must caution . . . that the experimentally observed polarity in right-left cognitive styles is an idea in general with which it is very easy to run wild. You can read today that things such as intuition, the seat of the subconsciousness, creativity, parapsychic sensitivity, the mind of the Orient, ethnocultural disposition, hypnotic susceptibility, the roots of the counterculture, altered states of consciousness—and what not—all reside predominantly in the right hemisphere. The extent to which extrapolations of this kind may eventually prove to be more fact or fancy will require many years to determine. Meantime it is important to remember that *the two hemispheres in the normal intact brain tend regularly to function closely together as a unit.* . . . (Sperry 1984:668; italics added)

One elusive higher function most cherished by psychics and mind quacks, invariably ascribed to the right hemisphere, is *creativity*. This word, coined in the last century (Garfield 1989), depicts a particular ability to create new things or to give new and ingenious answers to known questions, both in the artistic realm—to which the word was initially applied—and in sciences, or indeed in any field of human endeavor. Since characterizing and measuring creativity is a difficult task, it is hardly surprising that it is not easy to know

whether it is lateralized to either hemisphere.

Since both brain halves usually work together to ensure an integrated, harmonious function, it could be expected that different aspects of creativity would depend preferentially on one or the other hemisphere. For example, creativity in the field of literature or mathematics may rely on the left hemisphere, while plastic or musical creativity may depend on the right one. However, currently this assumption is no more than an educated guess. Moreover, it is difficult to assess whether a unilateral brain lesion may blunt creativity. Thus a study by H. Gardner (quoted by Zaidel 1984) showed that a number of painters underwent a change in style, but not a reduction in creativity, after right-sided lesions.

Indeed, Dahlia Zaidel's own studies suggest that the right hemisphere deals best with *stereotyped, conventional familiar* stimuli, while the left half seems to be mainly responsible for processing novel, unexpected, and uncommon stimuli and drawing new strategies to deal with them. Zaidel cautions:

> Since the right [hemisphere] is mute, assessment of functional specialization is difficult. Hence, it is viewed as a somewhat mysterious and an elusive part of the brain. Unfortunately, as with many scientifically uncharted domains, the unknown invites numerous speculations. One such popular speculation, not based on hard scientific facts, is that creativity lies principally in the domain of the right hemisphere functions. . . .
>
> The most parsimonious conclusion is that both hemispheres are involved in creativity, although it is tantalizing to consider that the creative impulse is generated by the left hemisphere after all. (Zaidel 1984: 339)

Psychics, gurus, and New Agers have transformed the right hemisphere into an "esoteric closet" in which to retrieve every conceivable mystical, parapsychic, or mysterious function. The best available evidence does not support their claims, with a single but important exception. Until recently, educational techniques were aimed to develop mainly those skills typical of left cognitive style, i.e., verbal language and analysis. Advances in the knowledge of brain functions have allowed the emergence of new educational trends with a more balanced approach, purporting the harmonic development of learning abilities (Bogen 1982). Of course these efforts should and can stem from our present scientific understanding of brain function, without the unwanted "help" of psychics and charlatans.

Conclusions

The brain normally works as an integrated unit; although each hemisphere specializes in certain functions, the hemispheres have a fluid communication and usually work together; both cooperate even in basic perceptual functions, not to mention more complex ones. For example, while seeing a known face, the right hemisphere is responsible for its recognition, while it is probably the left one that provides the name attached to that face. Moreover, each hemisphere may provide different associations to the same perception; e.g., when viewing a pair of open scissors, the right hemisphere may associate them with a fork and a spoon crossed (matching by appearance), while the left may link them with a sewing basket, thus matching by function (Trevarthen 1990).

In any case, the nexus provided by the hundreds of millions of nerve fibers that interconnect both brain

halves guarantees an integrated job. Therefore, the viewpoint widely held today by neuroscientists is that "the hemispheres are naturally different but equally important partners in generation of human communication, thinking and creativity" (Trevarthen 1990: 76).

In conclusion, it is a complete fallacy to state that we do not use our right hemisphere. On the contrary, when dressing ourselves, recognizing faces, going home, indentifying an object by touch, correlating bi- and tridimensional patterns, and communicating with others, all of us are continually using this important part of our single brain.

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Improving Science Teaching: The Textbook Problem

KEVIN PADIAN

In their article "Improving Science Teaching in the United States" (*SI*, Winter 1993), E. A. Marek and Wayne Rowe certainly have their hearts in the right place when they praise the values of hands-on, constructive laboratory science experience over the traditional read-the-chapter-and-answer-the-questions-at-the-end syndrome. Unfortunately, there are good reasons to suspect that the "learning cycle" experience they encourage so strongly can have, at best, only limited success and that, moreover, to concentrate on this panacea is to miss a much bigger piece of the problem.

Hands-on education will do little good unless the textbook industry improves its science literacy.

The reason most teachers use the antiquated, didactic method is that they are poorly prepared both in teaching and (more important) in science. A great number of teachers were pushed into teaching science: first, by growing student populations and, second, by shrinking ones that provided less demand for classes in Latin, German, Art, and so on. Younger teachers were let go, and senior ones were given the option of retiring or learning a new field—on the job. And, although there are notable exceptions, a majority of elementary-school teachers have poor to nonexistent backgrounds in science; developing a good science program in the face of all other demands on their time and resources cannot be their first concern. Because so many teachers themselves have never had coursework or experience in science, it is optimistic to think that they can transmit science effectively to students. Marek and Rowe begin by setting up the didactic, read-the-

chapter teacher as an all too real straw man. The aphorisms that extol the effectiveness of *doing* over *telling* as a teaching strategy are generally valid. But Marek and Rowe do not say how to ensure that hands-on activities will not be mindless, irrelevant, time-wasting, and expensive. Without this assurance, "hands-on" becomes only the latest in a series of pedagogical fads, destined for doom within a decade.

The key element here is the quality of educational materials, and I will argue that improving them is the fastest, cheapest, and most effective way to improve learning standards for science in the United States. Why? Because most teachers learn their science from the books in their classrooms. (I do not include those with strong college backgrounds in science, but those are mostly high-school and some junior-high science teachers.) We could improve science education in three ways: we could send all teachers back to school for two years; we could give every teacher in the country extensive in-service training; or we could require educational materials to meet higher standards and be written by people who actually know something about the field. Of the three options, the first two are impractical and prohibitively expensive. The third is necessary.

My characterization of the problem appears to slam the competence of an entire industry. But as Harriet Tyson-Bernstein (1988) points out, the fault lies with a system driven by the marketplace and fueled by the need to turn out copy-cat versions of the pablum that is not only expected but mandated by a host of Byzantine and often conflicting local and state regulations and tastes. Her book is an excellent overview of the situation; here, I want to comment on the competence issue. The relevance of this to Marek and Rowe's article is that it won't matter how hands-on any new instructional program is if it turns out to be like the present crop.

I am not a specialist in science education; but I have taught science from sixth grade through graduate students, and I was one of the writers and editors of the new *California Science Framework K-12.* I served last year on the panel that adopted science materials for grades K-8 in California and am a director of the National Center for Science Education. In these capacities during the past ten years I have had the opportunity to review a great number of science materials and to do a lot of rewarding work with teachers, publishers, and state officials. I have been glad to see considerable improvement in the quality of prose for students and in assistance for teachers whose specialty is not science. But the content is just as terrible as it ever was, mostly because the people who write these books don't know the field and don't seek the advice of those who do.

How else would you explain a sentence like "Many scientists believe that large scaly animals called dinosaurs lived on the earth millions of years ago?" (Right: the first three words function as a disclaimer for the last four, which offend Christian fundamentalists.) Many textbook writers can't tell heat from temperature, force from energy, or reptiles from amphibians. They have no concept of the history of the universe, the earth, or its life, and they think that there are three "kinds" of rocks. (These should not be taught as "kinds of rocks," but as processes that account for the formation and change of rocks.) In virtually every lesson on fossils from kindergarten to high school, students make an arts-and-crafts "mold" of something in plaster or jello, instead of learning or doing

something useful or interesting. Textbook writers create new points in geologic time ("near the end of the Devonian at the End of the Pernian" [*sic*]). They divide organisms into "simple" and "complex," and into "cold-blooded" and "warm-blooded." One life-science text even says (three times!) that a fish has scales so it won't leak. Where did these people go to school, and in which century?

These are simple errors, but we are not talking about simple problems here. Space does not permit explication of how out of touch typical textbook writers are with the overarching ideas of science and how the work in its various fields is done. This is the real problem: the people developing these books are clueless. Look at the masthead of a typical science textbook. How many names are of real scientists, familiar with the field? Generally, none or a couple at most. Today I received a major publisher's 7th-grade life-science book written by seven authors, only one of whom holds a college post. There are five "contributing writers"; three are professional writers, two are "science instructors." Thirty-six "content reviewers" are listed; none are scientists, all are "science instructors." This is not to say that these people are not knowledgeable, but they are writers and science educators, not scientists. Theoretically, they could know science very well. But if they do, why are the books as bad as they are? And, given this, why don't they ask for help from real scientists?

My colleagues and I once ran an informal check on a few names of known scientists that we recognized from mastheads. When we talked with these people, the typical story went like this: A publisher contacted the scientist and asked for a review of a chapter or two. The manuscript was sent, and the scientist pointed out some serious faults and suggested changes. The publishers sent their thanks and a check, and the suggestions were ignored. The scientist's name turned up on the masthead—and, we sometimes found, on the masthead of other books by the same publisher that the scientist had not even seen.

Make no mistake that the putative authors of textbooks are responsible for the final product. The published version is a committee effort by in-house writers, as discovered more than once by William J. Bennetta, publisher of *The Textbook Letter* (P.O. Box 51, Sausalito, CA 94966), which is well worth perusal.

The point is that we can hardly expect new, activity-centered curricula to be any more effective than the old ones have been, especially if they are developed by the same people—although they may be more fun for students and more user-friendly to some teachers. But all this activity comes at a price, and the price is time, space, effort, and money. A larger price is the loss of opportunity to transmit better material in a shorter time. When students spend two class periods making plaster casts of seashells, what have they learned? Most fossils are not molds and casts, and they don't form that way anyhow. And "molds and casts" certainly have limited relevance to any ideas, concepts, or issues in historical geology.

Activity-centered learning is a fine idea, but such programs require careful scrutiny. Marek and Rowe point out that using activities merely to demonstrate an obvious point, "cookbook-fashion," is not an effective use of hands-on time. Open-ended inquiry is preferable, but not all concepts lend themselves well to it, and it requires teachers who can knowingly and sensitively guide students in their inquiry processes while

A Quick True-False Test

The following statements are garnered from junior-high life-science, earth-science, and general-science texts. These books have been adopted by many states and districts in the past decade. Correct answers and comments by the author, Kevin Padian, are on page 392.

Directions: Mark each statement "true" or "false." If the statement is misleading, mark it false.

___ 1. The plural of the taxonomic rank "genus" is "genuses."

___ 2. The retina can be defined as part of a mammal's eye.

___ 3. During fermentation, energy is released as sugar and is changed to ethyl alcohol and carbon dioxide.

___ 4. Biologists classify organisms by their similar structure, behavior, food needs, and chemical make-up.

___ 5. Gregor Mendel coined the word "genetics."

___ 6. An oak tree is more complex than a fern.

___ 7. Uniformitarianism, the law of uniform change, means that the processes that changed the earth in the past still exist today.

___ 8. Amphibians are animals that live part of their lives on land and part in the water.

___ 9. One of Darwin's contributions to science is that he recognized that a species can change by the passing of genes for helpful traits.

___ 10. Darwin tried to show that different forms of life once lived on Earth.

___ 11. When the hemoglobin molecules of humans and chimpanzees are compared, a similarity is found.

___ 12. The forelimbs of a pig and sheep are homologous structures, but those of a giraffe are not homologous to those of the pig and sheep.

ensuring that some real concepts are being transmitted. I must admit considerable disappointment in these efforts submitted to the California science panel for adoption in 1992.

Another challenge is that about half of science (astronomy, geology, meteorology, oceanography, and much of biology) is not experimental, but historical. Designing experiments and activities for these fields is harder to do effectively. Much of the knowledge is not experimental, but experiential. It comes from reading, watching, observing, and thinking. This does not mean it can't be as much fun or as rewarding to learn; it simply means that no monolithic formula of the "scientific method" will be able to accommodate it.

For example, some "hands-on" programs teach concepts of predation and cryptic coloration to students by having them strew green and yellow buttons on a lawn and see which color is better represented when students have one minute to collect as many buttons as they can. This is fun, but obvious, and scarcely merits the time to do it, except that students *may*

Test Answers and Notes

All *of the statements are* false. *All are taken from approved, adopted textbooks reviewed by hundreds of teachers and educators. Simple factual errors are easy to correct; but many of these statements show deeper fundamental misunderstandings of science, and an all-too-obvious willingness to shove anything in front of children. Your tax dollars at work, folks!*

1. The plural of "genus" is "genera."
2. All *vertebrates* have retinas, not just mammals.
3. This is a direct quotation. Does it make any sense to you?
4. Organisms are classified by their relationships to other organisms.
5. William Bateson coined this term, which was unknown in Mendel's time.
6. This statement proceeds from a warped perception of complexity, which is essentially undefinable in biological terms. The original premise was that complex organisms evolved from simpler ones. Somehow another notion has got mixed up in here.
7. "Methodological uniformitarianism," which scientists accept as a working premise, holds that the *laws* of the universe have not changed. Rates and processes, though, fall under "substantive uniformitarianism," a different matter, and one not taken for granted as an operating principle. There is no "law of uniform change." Almost nothing changes uniformly.
8. So do marine iguanas, stoneflies, beavers, walruses, walking catfish . . . but not all or even most amphibians do.
9. Darwin didn't know anything about genes, nor did anyone else of his time.
10. He didn't need to show this; it was already perfectly well understood.
11. They are *identical.* Why don't the books want to say this?
12. This one is truly baffling. The pig and sheep are barnyard animals, whereas the giraffe is not, perhaps; but this has nothing to with homology. The forelimbs of all three are homologous because they are descended from a common ancestor.

—Kevin Padian

internalize cryptic coloration (if they're not having too much fun). But does it increase the students' knowledge of nature? Perhaps it would be more rewarding to watch a nature show in which actual animals had been filmed. The teacher, of course, would need to stop the video frequently, ask questions, stimulate discussion, involve written or group activities and problem-solving, and so on. The benefit here would be that students would engage in far more than one activity with a single point and they would probably learn about more than just cryptic coloration.

Marek and Rowe stress the "logical system" of constructivist science

generally embodied in the "science processes" (observing, measuring, recording, inferring, controlling variables, and so on) that have become the bread and butter of science education. But these processes, as important as they are to working with science, are only tools and must not be mistaken for ideas. The "whole real guts" of science, to paraphrase C. H. Waddington, is the theories, the overarching ideas that unite facts and concepts and set the program for real investigation. Until the people who write instructional materials and educate teachers learn to center on the theories of science, rather than those of pedagogy, we can probably expect little improvement in science education.

The last point is especially important to CSICOP, because there are an alarming number of people in this country who cannot distinguish science from astrology, religious belief, crystal healing, or occultism. This is not because they have not had enough hands-on activities dropping objects of different densities off tabletops or making plaster casts of seashells. It is because they have no sense of the construction of science.

They do not realize how energy is conserved and transformed and what this means to physical phenomena. They do not know why tectonics explains nearly all geological phenomena, from mountain-building, earthquakes, and volcanoes to the distribution of plants and animals on earth, and even to the existence of oceans and atmospheres. They have no idea that evolution explains not only the relationships of living and fossil organisms but also why the structures of organisms are built as they are and how their functions have changed over time. And they do not understand the relationships among these overarching theories and the fields that they innervate. And that is because science is not taught this way in the United States of America. If it were, we would have a scientifically literate citizenry, and we would have classrooms of students filled not only with the anticipation of activity or the anticipation of discovery but with the anticipation of understanding.

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The Eyewitness
Imperfect Interface Between Stimuli and Story

JAMES R. REICH, JR.

The eyewitness is a link between an event that has taken place and the reporting of that event. In a real sense the memory of an individual is put to the test when a detailed account of what took place is desired. Eyewitnesses provide the support needed in our current legal system. Without their testimony many cases could not proceed and due process would become meaningless. Eyewitnesses' accounts are also the thread with which the fabric of a seemingly paranormal or other anomalous event is woven by the people who investigate or disseminate such claims. It is important, then, to have some understanding of how memory works and what might affect the recall of that memory after it has been recorded.

The study of how people recall events was initiated at the turn of this century by the Harvard psychologist Hugo Munsterberg (1863-1916). In his work he found that people tend to remember events as slightly different from how they actually happened. One of his experiments, conducted during a scientific meeting, involved an incident in which a clown from a passing carnival rushed into the room followed by a man with a revolver. There was an argument followed by a skirmish and several shots, after which both individuals left. The stunned audience was asked by the group leader, the only one there who had prior knowledge of the experiment, to write down all they could remember about what had just happened. Analysis of the information gathered showed that only one individual out of the forty present was able to recall the event with any accuracy.

The eyewitness is present at the scene, but the story he or she relates isn't necessarily an accurate description of what has occurred. In fact, it is often a mosaic of both reality and fiction.

More than half of those present could manage no better than a 60-percent recollection.

Recent research includes work on leading questions. Richard J. Harris (1973) asked questions using quantitative adjective or adverb pairs, such as "old/new" and "tall/short." The subjects in his study were divided into two groups. Each group was instructed to make as accurate a guess as possible in answer to a series of questions. For instance, one group was asked the question: "How *tall* was the basketball player?" while the second group was asked "How *short* was the basketball player?" Harris found that the group that was asked "how tall" estimated the height at about 79 inches, while those who were asked "how short" estimated the height at 69 inches. A full 10-inches—practically one foot—difference!

Using the same pattern in a different question, subjects were asked about the height of an office building. The answers of those who were asked "How high was the office building" averaged a height of 26 stories, while those who were asked "How low was the office building" averaged only 13 stories—exactly one-half that of the first group.

Other researchers have continued probing the leading-question phenomenon. Elizabeth Loftus asked individuals questions about their headaches and the products they used to treat them. The first set of questions asked were (1) "In terms of the total number of products, how many other products have you tried? One? Two? Three?" or (2) "In terms of the total number of products, how many other products have you tried? One? Five? Ten?" The responses to question 1 averaged 3.3 different products, while the responses to question 2 averaged 5.2 different products. The second key question asked was (1) "Do you get headaches frequently, and, if so, how often?" or (2) "Do you get

headaches occasionally, and, if so, how often?" The "frequently" group reported an average of 2.2 headaches a week, while the responses of the "occasionally" group averaged 0.7 headaches a week.

Loftus (1974) investigated the possible effects that leading questions may have on memory. The key to her research centered around an initial presupposition. For example, the question "How fast was the car going when it ran the stop sign?" presupposes that there was a stop sign. In reality, the stop sign may or may not have been there. If it was there, Loftus suggests, then answering the question may strengthen or enhance the experience by making more available certain key memory representations corresponding to the stop sign. On the other hand, if the stop sign was not there, Loftus speculated, then it may be treated as new information that could surface at a later time, when the stop sign could be remembered as actually having been there.

Several experiments were conducted to see if this actually is the case. In the first experiment two groups viewed a film of an auto accident, after which they were to answer a ten-item questionnaire. The film showed a car that, after failing to stop at a stop sign, made a right turn. In order to avoid an accident the driver of a car in the oncoming traffic hit the brakes, causing a five-car bumper-to-bumper collision. A diagram was provided labeling the car that ran the stop sign as car A and the cars involved in the collision as B through F. Two key questions were asked. For one group the first question was "How fast was car A going when it ran the stop sign?" The first question for the other group was "How fast was car A going when it turned right?" the second question, asked of both groups, was "Did you see a stop sign for car A?" The results showed that 55 percent of those who were first asked the "stop sign" question answered that they did see the stop sign, while only 35 percent of those answering the "turned right" question answered in the affirmative.

Loftus developed two hypotheses to explain this effect. First, when subjects are asked the initial "stop sign" question, this reinforces their memory of the stop sign and they respond at a later time with this reinforced representation. Loftus's second explanation, called the construction hypothesis, suggests that subjects use the presupposition in the initial "stop sign" question to reconstruct in their memories the existence of the stop sign. The importance of the construction hypothesis is that any type of information can subsequently be introduced into a person's memory using questions containing presuppositions, whether the presuppositions are true or false.

Loftus's second experiment was set up to determine whether the construction hypothesis could be supported. In this experiment subjects viewed a 3-minute videotape excerpt showing a disruption in a classroom by eight demonstrators. After the video was shown, a questionnaire with 20 questions was distributed. The subjects were divided into two groups. Nineteen of the questions were similar. The one key question that differed was either (1) "Was the leader of the 4 demonstrators who entered the classroom a male?" or (2) "Was the leader of the 12 demonstrators who entered the classroom a male?" After a week the subjects were asked a new set of 20 questions with the key question for all being "How many demonstrators did you see entering the classroom?" Those who had answered the question counting the number of demonstrators as 12 thought they remembered an average

of 8.85 in the video, while the group who had answered the question referring to 4 demonstrators recalled an average of 6.40. This experiment demonstrated that false numerical data can have an effect on an individual's memory. Loftus next wanted to find out if the same results could be seen when the false presupposition concerned something that didn't exist.

In this experiment subjects viewed a short videotape of an automobile accident and then answered ten questions based on the accident. The subjects were divided into two groups. One group was asked the key question "How fast was the white sports car going when it passed the barn while traveling along the country road?" and the other group had the question "How fast was the white sports car going while traveling along the country road?" In fact, there was no barn in the video. One week later the subjects returned and answered ten questions about the accident, the key question for everyone being "Did you see a barn?" Of those subjects earlier exposed to the false presupposition that there was a barn 17.3 percent responded that they had seen a barn. Only 2.7 percent of those who did not have the presupposition in the original question responded that they had seen a barn.

To explain this, Loftus described a theory of memory for complex visual experiences. In this theory there are two main processes. The first deals with the acquisition of data, and the second delves into the retrieval of that data. The acquisition can further be divided into two components. The first is the acquisition of the original experience. Clearly not everything that happens to us can be stored in our memory. The mind separates what is and is not to be stored by the amount of attention we give a particular object. If we go for a walk across a field, chances are we will let our minds wander a bit. Soon we find that we have covered a lot of ground. Immediately we wonder how we got where we are. Since we haven't focused our attention on the walk, nothing is remembered. The same kind of thing can happen when we are reading. How many times have you read a paragraph only to discover you have no idea what you have read? In order to acquire a particular memory we must concentrate on what it is we want to store. Once our attention is focused, the mind transforms the information into some form or representation that can be stored in the brain. This newly acquired information is not carved in granite by any means. It is subject to future alterations by a mixing of the actual event with subsequent or even prior information. This illustrates the second component of the acquisition process, the acquisition of additional information. It is at this step where leading questions enter into the picture and are able to distort the true representation stored in memory.

The retrieval process will come into play at any time after the initial experience. Each time the event is brought into conscious thought there is a possibility of altering the original memory. The farther removed from the event, the greater the chance of an imperfect or distorted recollection.

Recently, researchers have added to the understanding of why leading questions affect those who encounter them. Smith and Ellsworth (1987) indicate that the uncertainty surrounding the memory of an event is an important antecedent for the effectiveness of being misled. A clear memory is less susceptible to being fooled by leading questions. Memories of tangential details are more prone to alteration when leading questions are used than are more important details.

Smith and Ellsworth also found that subjects accept leading questions more readily from those they think are more knowledgeable about the event or situation than they themselves are. For example, if a person witnesses some type of crime and the crime is severe enough, say an armed robbery, he or she will experience a lot of stress. Stress usually lessens the witnesses' ability to perceive the event (Clifford and Scott 1978; Loftus 1980). Later, when the police are trying to find out what has happened, they may ask questions that a witness feels he should know the answers to even if he doesn't: "About what time was it when the robbery took place?" "What type of clothing was the perpetrator wearing?" "Was he tall? Short? Fat? Thin?"

If the witness is at all hesitant, the officer may probe with more specific questions, and the witness may be intimidated to answer using the clues that the officer is unintentionally giving.

Officer: "Did it happen in the morning?"

Witness: "I'm not sure, but I believe so—yes, it did take place in the morning."

Officer: "Was he wearing a red longsleeved shirt?"

Witness: "Yes, it was longsleeved. I don't remember the color."

And so on.

When one is interviewing a witness to an event, it is best to present oneself as being as much in the dark about it as the witness.

Another area of investigation concerning eyewitness testimony is the apparent relationship between the accuracy of a witness's testimony and his or her overall confidence. Studies have indicated that nearly 40 percent of defense attorneys agree that there is a positive correlation between the accuracy and confidence of the witness. Although it was found in one study (Kassin 1985) that accurate responses were made somewhat more quickly than inaccurate responses, confident responses were made much more quickly than unsure replies. In other words, the less time it takes to reply, the greater the amount of confidence that can be attributed to the witness. But is this a valid assumption? Further experiments (Smith, Kassin, and Ellsworth 1989) have shown that there is little to suggest that confidence is a good predictor of accuracy, and relying on such a correlation may actually be misleading.

For serious investigations into seemingly paranormal or other anomalous events, it would appear that the investigator should follow a few simple guidelines. First, he or she should determine how many other investigators have already had contact with the individual in question. If the number is high, there is a good chance that the original memory of the event has evolved into something a little different. This would only be natural and should actually be expected in most cases. The second guideline is that investigators should interact with witnesses in such a way that they are not intimidating. Theyfj should not be guilty of "tampering with the evidence," the "evidence" being the memory of the reporting individual. Lastly, the investigator should not be influenced by the apparent speed or lack of speed with which the individual replies to a question. A quick reply does not necessarily assure that it is an accurate or truthful answer, nor does a hesitant response mean it is an inaccurate answer. It's up to the investigator to use good judgment when conducting an interview. This may result in shedding new light on many paranormal claims.

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OUT THERE Rob Pudim

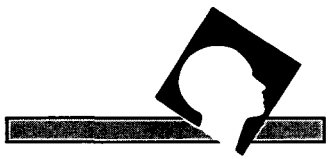
80% ACCURATE! ACE... 2... 3... 4... 8!
AWW! THE FULL HOUSE IS IN MY NEXT HAND.
I DIDN'T BOTHER TO PLAY. I KNEW IT WAS GOING TO BE A LOUSY HAND.
DARN! 60% ACCURATE.
'93
Skeptical Inquirer

PSYCHICS PLAYING POKER.

Pathological Science: An Update

ALAN CROMER

The Nobel chemist Irving Langmuir (1881-1957) used to give a cautionary talk on pathological science, and photocopies of a transcription of his December 13, 1953, colloquium circulated for years before being published in 1989 (Langmuir 1989). In this memorable talk, Langmuir told a number of stories of pathological science and listed the features they have in common. Here I would like to retell two of these stories and add one of my own. These case studies clearly show features common to all pathological science and how such pathology can arise even among competent scientists. With this background, the recent case of cold fusion is seen as a textbook example of pathological science.



From N-rays to cold fusion, scientists have been seeing things that aren't there.

One of Langmuir's stories goes back to 1903. Wilhelm Roentgen's discovery of X-rays in 1895 was a major event in science and initiated a burst of new research. While most scientists were content to learn as much as possible about this mysterious new emanation, others wanted the glory of discovering emanations of their own. So perhaps it wasn't surprising that in 1903, Prosper René Blondlot, a distinguished member of the French Academy of Sciences, announced the discovery of N-rays which he had produced by heating a wire inside an iron tube.

These rays didn't pass through the iron, but did pass through an aluminum window in the iron. They were detected by looking at a very faintly illuminated screen in an otherwise dark room. If the N-rays were there, the screen became more visible; of course a great deal of skill was needed for this because the screen was just on the edge of visibility. Under these conditions, he discovered that many different

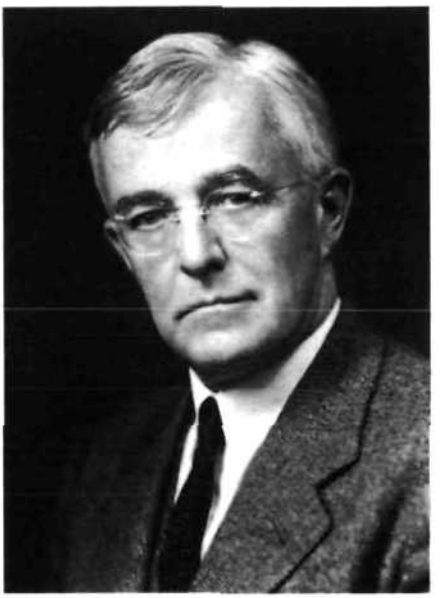
things give off N-rays, including people. Then he discovered negative N-rays, which decreased the visibility of the screen. He published many papers on the subject, and so did many others, confirming a multitude of unusual properties for these rays.

Among them was the fact that they could be broken up into a spectrum by passing them through a large aluminum prism. In 1904, the American physicist R. W. Wood visited Blondlot and found him measuring, to a tenth of a millimeter, the position of the N-rays as they came through an aluminum prism. "How is that possible," Wood asked, "when the original beam is coming from a slit two millimeters wide?"

"That's one of the fascinating things about the N-rays," Blondlot replied. "They don't follow the ordinary laws of science." So Wood, the room being very dark, removed the aluminum prism that was bending the N-rays onto Blondlot's screen and put it in his pocket. Blondlot, unaware of this, continued getting the same results. Wood published a report of this incident, in *Nature*, which put an end to N-rays.

In 1934, Langmuir himself visited the parapsychologist J. B. Rhine at Duke University and pointed out that Rhine's work had all the characteristic symptoms of pathological science. Rhine thought it would be great if Langmuir published this. "I'd have more graduates," he told Langmuir. "We ought to have more graduate students. This thing is so important that we should have more people realize its importance. This should be one of the biggest departments in the university."

Rhine had begun his studies in extrasensory perception at Duke University in 1930. Most of these were done with cards showing one of the five ESP symbols: a circle, a cross, wavy lines, a rectangle, and a star. Usually a deck was used that had five cards of each kind, 25 in all. The deck would be shuffled and cut, and the subject would call the cards in the order they were picked from the top of the deck. Since there are five different cards, there is a one-in-five chance of a correct call. Results are usually reported as the number of correct calls out of 25. If there is no extrasensory perception, the average of many scores would be 5, although individual variations of plus or minus 3 aren't unlikely.



Nobel laureate Irving Langmuir, who often warned of pathological science (photo courtesy of GE Research and Development Center).

Langmuir spent the whole day with Rhine, who was in a philosophical mood. "People don't like these experiments," he said. "They don't like me. Sometimes, to spite me, they made their scores purposely low [less than 5]. . . . I took [these low results] and sealed them in envelopes and I put a code number on the outside, and I

didn't trust anybody to know that code. Nobody."

Langmuir thought this interesting. "You said that you had published a summary of all your data and that the average was 7. Now you are saying you have additional data that, if added to your published data, would bring the average to 5. Will you do this?"

"Of course not," he said. "That would be dishonest. The low scores are just as significant as the high ones, aren't they? They proved that there is something there just as much, and therefore it wouldn't be fair [to combine negative and positive data]."

Rhine felt justified in withholding low scores from his average because he believed the low scorers were deliberately (or paranormally) producing their low scores. Such self-deception is a common human failing, not restricted to occultists. Mainstream scientists sometimes delude themselves as well, as the following case shows.

The A_2 is an elementary particle created in experiments in which pi mesons from a high-energy accelerator collide with the proton nuclei of ordinary hydrogen. The direction and energy of the recoil proton after each collision is measured by a complex array of electronic detectors. The data from the detectors are stored on magnetic tape for later computer analysis. If a particle is created in some of the collisions, it appears as a bump in a plot of the analyzed data. All such bumps, technically called resonances, have similar shapes, which follow from fundamental theory. But in 1967, a group at the European Center for Nuclear Research (CERN) in Geneva found that the resonance of the A_2 had an anomalous dip in the center (Figure 1); the resonance was split (Chikovani et al. 1967).

This was a startling discovery, contrary to all experience. As seen in Figure 1, the CERN dip has only a few points in it, each with a probable error that is one-quarter the size of the dip. Still, the probability of this being a statistical fluctuation is less than 0.1 percent. Immediately, theorists started churning out papers to explain the greatest anomaly since parity violation.

The position in energy of the A_2 dip had been so well determined by the CERN equipment that the experimental group from the Northeastern University Physics Department planned to use it to check an experiment they were doing at the Brookhaven National Laboratory on Long Island, New York. To their great disappointment, they didn't see the dip. A dip is something that could easily be missed if there were a problem with the experiment, but something that was unlikely to be created by a problem. Thus the Northeastern group first thought the problem was theirs, not CERN's. But after repeated checks of their equipment revealed no problems, and repeated experiments continued to show no dip, they announced their results at a stormy meeting of the American Physical Society in 1971 (Bowen et al. 1971).

A spokesman for the CERN experiment vigorously defended its result, claiming that the *fact* that CERN saw the dip *proved* that the CERN experiment had better resolution. To which Bernard Gottschalk, speaking for Northeastern, replied, "Seeing spots before your eyes doesn't mean you have better vision." And so, amid cheers and catcalls, the physicists argued their cases. Within a few months, Northeastern's results were confirmed by other groups, and the dip was never seen or heard of again.

This leaves the question of how a group of distinguished scientists, using the best equipment in the world,

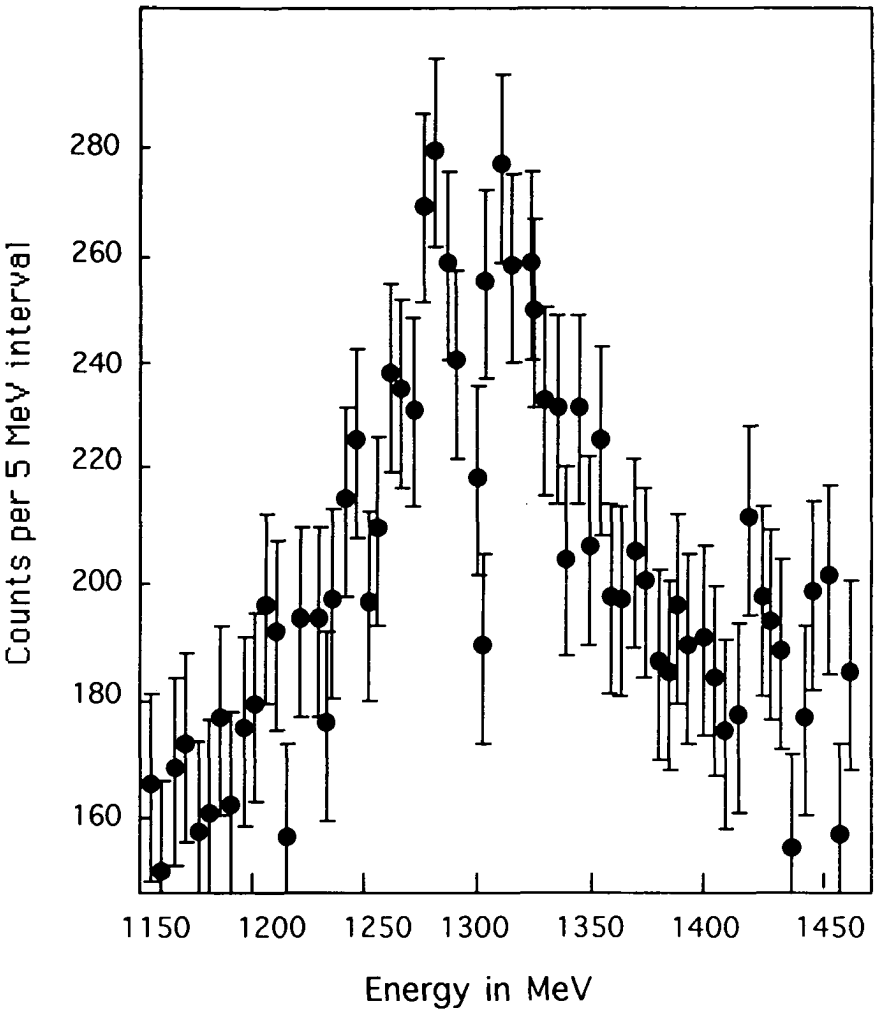


Figure 1. The A_2 resonance as reported by the experimental group from CERN (Chikovani et al. 1967). The anomalous (and erroneous) dip in the middle of the resonance was caused by a bias in the way the data were selected.

could see something that wasn't there. The CERN group, it seems, did exactly what Rhine had done—discarded data that didn't show what it wanted to find. As one CERN scientist so ingenuously explained to Gottschalk: "We broke the data into batches. Whenever we found a batch with no dip, we looked very carefully for something wrong and we always found something." Since they didn't look so carefully for trouble when a batch showed a dip, and since there is always something wrong in every run of a highly complex experiment, they managed to boost an initially insignificant glitch into pathological science.

This story is worth telling because we are dealing here, not with a few benighted occultists, but with a large team of highly trained scientists working with a mountain of electronic equipment and computers. But in the end, both Rhine and the CERN group

were fishing in the noise for inexplicable phenomena.

Langmuir found that the cases of pathological science he had studied shared certain characteristics. They are generally claims, based on a weak or marginal effect, of fantastic phenomena contrary to all experience. There are conflicting reports from independent investigators. Reasonable explanations of the data, based on known science, are rejected. Interest rises rapidly for a time, then gradually fades away.

Nothing follows this description more closely than the case of cold fusion. [For a previous discussion, see Milton Rothman's "Cold Fusion: A Case History in 'Wishful Science'?" *SI*, Winter 1990, pp. 161-170.] It was at a press conference on March 23, 1989, that Stanley Pons, a chemist at the University of Utah, and Martin Fleischmann, a chemist from the University of Southampton, England, first announced that they had obtained a controlled fusion reaction in a small electrolytic cell. This claim is certainly contrary to all experience or understanding of both nuclear and solid-state physics. Furthermore, Fleischmann and Pons didn't detect the lethal dose of neutrons that should have accompanied the amount of fusion they reported. Their claim was doubly fantastic. A miracle squared.

Immediately after the press conference, a group of physicists at Brigham Young University, headed by Steven Jones, made a similar announcement. The two groups had been working independently, but became aware of each other's work some months earlier. At a meeting that involved the presidents of these two Utah universities, an agreement was reached that on March 23, 1989, each group would submit a paper on its work to *Nature*. Pons and Fleischmann also announced their results at a press conference on the same day, which wasn't part of the agreement.

Nature accepted the Jones paper (Jones 1989), but not the Fleischmann and Pons paper. This didn't delay publication, however, because Fleischmann and Pons had already had their cold-fusion paper accepted by the *Journal of Electroanalytical Chemistry* (Fleischmann, Pons, and Hawkins 1989).

How inconsistent were the Utah results with previous experience? Fusion reactions—nuclear reactions in which two light nuclei combine to form a heavier one—have been intensely studied for more than 50 years. They are the basis of the hydrogen bomb, of the energy production of the sun, and of research efforts to produce controlled fusion on earth. In the Utah experiments, the reaction involved the fusing of two deuterium (hydrogen-2) nuclei, which generally produces either a tritium (hydrogen-3) nucleus and a proton or a helium-3 nucleus and a neutron. The fusion of two deuterium nuclei into a helium-4 nucleus and a gamma ray occurs less than one percent of the time.

A deuterium nucleus consists of one proton and one neutron; it is an isotope of the hydrogen nucleus, which is just a single proton. Normally the deuterium nucleus has an electron encircling it, in which case it is an atom of deuterium (heavy hydrogen). Deuterium, like hydrogen, is a gas at room temperature; in this gas the deuterium atoms are combined in pairs, forming a molecule.

The difficulty of achieving fusion comes from the fact that two deuterium nuclei repel each other electrically, because each is positively charged. They normally don't get close enough to interact. In a deuterium molecule, the electrons overcome this repulsion to a large extent, and the

two nuclei in the molecule are 7-millionths of a millimeter apart. This is still too far apart for them to fuse, but Jones had previously achieved fusion by replacing one of the electrons in a deuterium molecule with a negatively charged muon (Rafelski and Jones 1987). The muon is 200 times heavier than an electron and brings the two deuterons 200 times closer together. At this separation, fusion occurs at a measurable rate, though not enough energy is released to pay for the cost of creating the muons.

It thus is clear that cold fusion is possible if two deuterium atoms can be squeezed together closer than they are in a deuterium molecule. It is also well known that many metals, including palladium, absorb hydrogen. Therefore, isn't it reasonable to suppose that, if deuterium were forcibly incorporated into palladium using an electrical current, deuterium atoms could be squeezed together close enough for their nuclei to fuse?

No, it isn't. The palladium atoms are themselves three times farther apart than are the two deuterium atoms in a deuterium molecule. The palladium is able to absorb deuterium molecules *because* the spacing between the palladium atoms is larger than the diameter of the deuterium molecule. No squeezing is involved. In fact, the deuterium molecule breaks apart inside the palladium, and its two deuterium atoms end up being farther apart in the palladium than they were in the free deuterium molecule.

Furthermore, Fleischmann and Pons claimed their fusion reaction generated a large quantity of heat. A simple calculation shows that if the heat they claimed were due to fusion, there would have been enough neutrons generated to have killed the experimenters. They took the absence of the neutrons as the discovery of a new type of nuclear reaction.

Scientists weren't immediately aware of all this when the announcement was made at a press conference. So when reporters asked scientists for their assessment of the Utah experiments, there were mixed responses. Philip Morrison said, "Based on the information I have, I feel it's a very good case." He said his confidence in the reality of the reaction was "high, but not conclusive." The Nobel physicist Sheldon Glashow said, "I don't believe a word of it" (Chandler 1989b). The amusing comment of Kim Molvig—"I am willing to be open-minded, but it's really inconceivable that there is anything there" (Pool 1989)—probably reflects the ambiguous use we often make of "open-minded." Most alarming were the comments from scientists who put extraordinary confidence in Fleischmann and Pons: "I'd be extremely surprised if they've done anything stupid. They have a very good track record in electrochemistry. I am pretty excited about this" (Chandler 1989a). In fact, stupidity, or human error, or self-delusion in science, is far less surprising than is the radical overthrow of well-established doctrine.

A number of confirming experiments were reported soon after cold fusion was announced, followed by a deluge of nonconfirming experiments. At one point, we had the peculiar situation that physicists largely rejected the cold-fusion claims, while many chemists accepted them. In July 1989, a U.S. Department of Energy panel stated that there wasn't sufficient evidence of cold fusion to warrant government funding. Still, Fleischmann and Pons—together with the remnants of their followers—carried on for another year, supported by the largesse of the State of Utah.

Jones and his group did detect a slight excess of neutrons above back-

ground radiation, but mostly in the first hour of the experiment. Some other groups also reported excess neutrons, but many groups didn't see any more neutrons than are usually present in background radiation. So this is clearly a marginal effect. The heat claimed by Pons and Fleischmann—though not in principle marginal—in fact resulted from heavily processing data obtained by incorrect procedures. They never actually generated the heat they talked about.

But for the layperson, unfamiliar with the science involved, the most characteristic sign of pathology was the language used. Fleischmann and Pons's insistence that "it is inconceivable that this [heat] could be due to anything but nuclear processes" isn't the language of science. It is the language of minds fixed on their own strongly held beliefs and unwilling to listen to the justified skepticism of others.

There are many lessons from this episode. First, scientists themselves are often poor judges of the scientific process. Many took Fleischmann and Pons's incredible conclusions about their own work at face value, before even reading their papers.

Second, scientific research is very difficult. Anything that can go wrong will go wrong. Fleischmann and Pons forgot to stir their cell while measuring its temperature, totally invalidating their measurements. Working in secrecy and isolation, even experienced scientists will be hindered by the lack of guidance and criticism of others.

Third, science isn't dependent on the honesty or wisdom of scientists. It is a collective enterprise that seeks to obtain the broadest possible consensus among its practitioners (Ziman 1968). It will survive Fleischmann and Pons, but only after the wasteful expenditure of hundreds of man-years of work and at least one death (Dye 1992).

Real discoveries of phenomena contrary to all previous scientific experience are very rare, while fraud, fakery, foolishness, and error resulting from overenthusiasm and delusion are all too common. Thus, Glashow's closed-minded "I don't believe a word of it" is going to be correct far more often than not. As Langmuir said about earlier nonexistent phenomena:

> These are cases where there is no dishonesty involved, but where people are tricked into false results by a lack of understanding about what human beings can do to themselves in the way of being led astray by subjective effects, wishful thinking, or threshold interactions. These are examples of pathological science. These are things that attracted a great deal of attention. Usually hundreds of papers have been published upon them. . . .
>
> [But] the critics can't reproduce the effects. Only the supporters could do that. In the end, nothing was salvaged. Why should there be? There isn't anything there. There never was. (Langmuir 1989)

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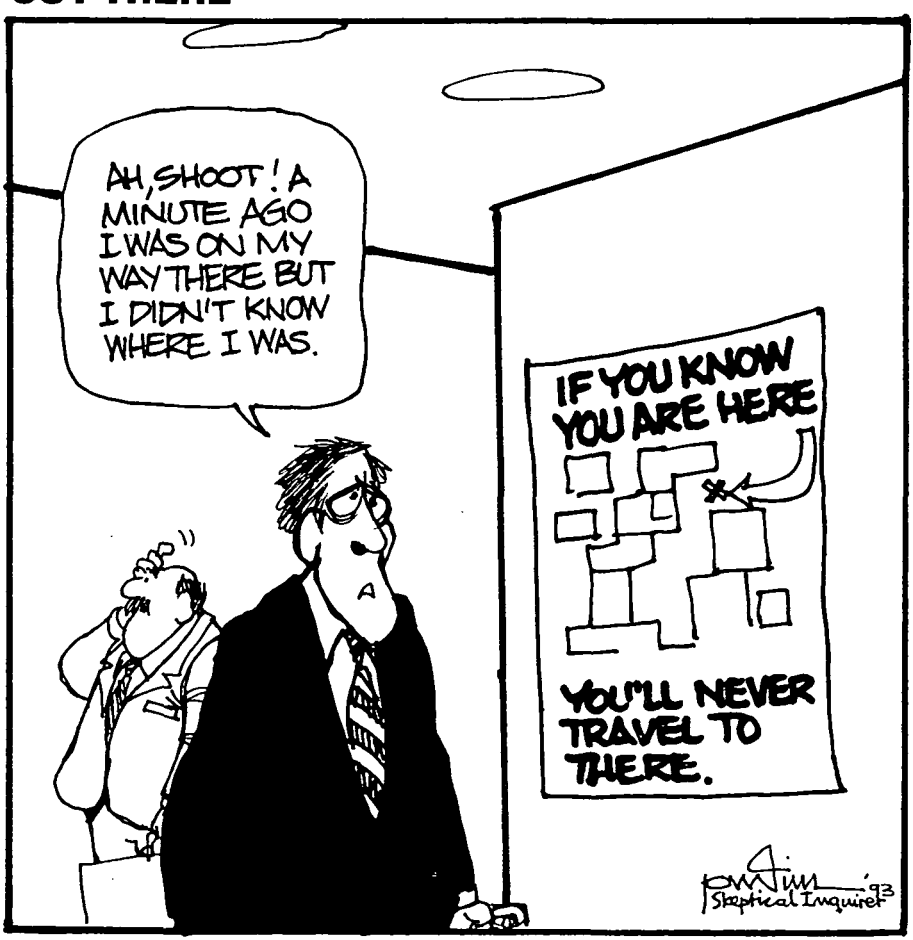
OUT THERE Rob Pudim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'93
Skeptical Inquirer

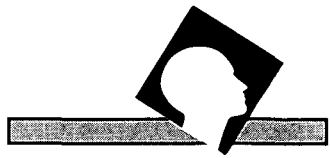
THE HEISENBERG UNCERTAINTY PRINCIPLE AND REAL LIFE.

Jack Horkheimer, "Star Hustler"

The SKEPTICAL INQUIRER talks with Public Television's exuberant "Star Hustler"

Interview by GABRIEL SEABROOK

Avid astronomy interpreter, freethinking teacher, and popular television personality, 54-year-old Jack Horkheimer has become something of an institution to astronomy buffs around the world. Indeed, his enthusiasm for science is infectious, as I found out when I visited him in his spacious, sunny office at the Miami Space Transit Planetarium.—G.S.



"It seems that there is something that naturally excites us, that fills us with awe and wonder, when we look up at the stars."

SI: Most astronomers are content to work quietly behind the scenes in offices, labs, and observatories. Yet you write and host your own television program. What inspires you to bring astronomy before millions of viewers each week?

Jack Horkheimer: Ever since I was a kid, I've been a science nut; in fact, I'm addicted to all the sciences. As I grew older, I would often find myself talking about the latest discovery to someone, or explaining the wonders of some particular aspect of science. And so early on I realized two things: first, that I wanted to share this enthusiasm with others, and second, that I had a talent for communicating. But more important, I wanted to make science accessible to people. When I finally had the opportunity to create "Star Hustler," it was for one reason: to turn on as many people as possible to the wonders of modern science and astronomy.

SI: How does a "Star Hustler" episode get put on the air?

J.H.: With a great amount of difficulty and angst! The basis of each show starts with something I think will interest people; something that people can see in the night sky, from

anyplace, at that time of year. We view each episode as a short story that requires both drama and humor. We start with a 20-minute script, hold production meetings, art meetings, and finally the computer specialists get together for the animation layouts. We do four episodes a month, one for each week. It takes about two weeks and 35 people to complete four shows. There's so much I'd like to say on the air about the stars; I only wish I had fifty minutes instead of four!

SI: What questions are most often asked by your viewers?

J.H.: The number one question is, believe it or not, "What's the name of that music you use in the beginning of your show?" [Debussy's *Arabesque* No. 1; Tomita, "Snowflakes Are Dancing," RCA.] The second most asked question, "Are you really that excited about the stars?" Yes, I am! The third: "Is that space beam real, and have you ever fallen off?" The answer: Yes, it's real, and yes, I've fallen off!

SI: Besides working with public television station WPBT on "Star Hustler," you're also involved with the Miami Space Transit Planetarium. How did you come to be executive director there?

J.H.: Well, I started off running the planetarium as a volunteer; it was kind

"I want to reach people no one else has been able to reach."

of a hobby for me. I worked seven days a week, sometimes fourteen hours a day. After the first year, they asked me if I'd like to take over permanently. I said, "What does that entail?" They said, "We'll pay you." I said, "Great!" That was 24 and a half years ago!

SI: Tell us about the Miami Space Transit Planetarium itself.

J.H.: It opened in 1966 as one of the largest planetariums of its kind. It's unique in that the starfield is one of the few ever designed by Roy K. Marshall, the great astronomer of the forties and the fifties. It's probably one of the most natural looking starfields in the world. We can duplicate all kinds of motions, not only on the planet but off the planet. We've won international awards, our shows are seen all over the world, and we were the first planetarium ever to get a grant from NASA to produce an international show [*Starbound*]. We were the first planetarium in the country that we know of to produce science dramas: full multimedia shows, full soundtracks, professional narration. Sally Jessy Raphael narrated my shows *Child of the Universe* and *Buck Rogers, Right On.* Leonary Nimoy, Arthur Godfrey, and several other media celebrities have done shows for us here too.

SI: While astronomers today use radio telescopes instead of stone circles, isn't humanity's primal fascination with the stars still at the root of contemporary astronomy?

J.H.: Yes. We are animals; we are biological, chemical organisms; we are products of evolution. Our fascination with the stars goes way back to prehistoric times. Indeed, it seems that there is something that naturally excites us, that fills us with awe and wonder, when we look up at the stars. All great religions placed their gods in the skies, and for good reason: the stars inspire us with their inaccessibility and with their permanence. Though the seasons change, the stars always remain the same. I think this engendered incredible wonder in prehistoric men and women, who saw the stars as unchanging, immortal beings.

SI: How did you yourself become interested in astronomy?

J.H.: I think all astronomers worth their salt will admit that it begins in childhood; something back then got them hooked on the awe, the immensity, the wonder of it all. For me, it was a lunar eclipse. Wow!"

SI: What prompted you to then go on and take up the study of stars professionally?

J.H.: Harlow Shapley, one of the great astronomers of our century, said, when asked that same question, "Because they're so pretty."

SI: Your approach to astronomy on "Star Hustler" has on occasion been called "too flamboyant." The word *hustler* itself suggests a carnival-like atmosphere. What do you say to those who assert that science is a serious topic that should be presented in a restrained, scholarly manner?

J.H.: One word? Bullshit. They're wrong. This attitude turns science into a religion, makes it inaccessible, the very opposite of what it should be.

SI: Science then becomes dogmatic?

J.H.: Of course! It becomes the very thing that good scientists are screaming against. How far are we away from astrology when we get misguided scientists going around saying that astronomy must be treated with great reverence? Science is for everyone!

SI: How do you see your role as a popularizer of astronomy?

J.H.: I want to reach people no one else has been able to reach. I could tell you lots of stories about people who have been turned on to the stars for the first time through my television shows and planetarium lectures; young and old, educated and uneducated, from every walk of life. I get letters from people in nursing homes telling me that they watch my show because they can no longer see the stars themselves. Then there are the kids who get their first telescope after coming to the planetarium or watching the television show. This is my reward. I don't do "Star Hustler" for the money. I do it because I want to share my love of science with others.

SI: Many people continue to believe that the full moon brings out violent, romantic, or lunatic behavior in otherwise "normal individuals. How do you defend the moon against such charges?

J.H.: Well, it's true: celestial bodies *can* affect the human mind. Suppose you get hit in the head by a meteorite? That would definitely have a direct effect! Seriously though, the moon does affect human behavior, but not in the way most people think it does. Historically speaking, there once *were* more crimes committed during the full moon. Not because of some mysterious lunar force, but for two very simple reasons: one, before the advent of gas and electric light, many people found it more convenient to travel, plant crops, or hold festivals, parties and meetings on nights of the full moon because of the bright light. The more people out, the more easily crimes were committed against them. Second, with so many people out and about, more homes were empty. The result? More break-ins. Today, however, with modern lighting, all of that has changed. Statistics now show that there isn't any rise in crime at all during a full moon. Yet stories about the moon and crime from our grandparents' day are still circulating, leading many to believe that the moon directly affects human behavior. This nonsense is then reinforced by the wild claims of astrologers.

SI: In 1984, the Committee for the Scientific Investigation of Claims of the Paranormal called on all of the newspapers in the United States to carry a disclaimer in their astrology columns. As an astronomer, what are your views on astrology?

J.H.: People search for guidance. If they don't get it from formalized

"I do it because I want to share my love of science with others."

religion, they turn to an informal religion, and that's what astrology is; it's an informal religion. The books don't say this, but it's the biggest, most popular religion in the world. [Anthropologists refer to astrology as one of the "celestial religions.] The planets and stars were originally thought to be deities that affect human behavior, human destiny. It's said, really, that so many people today continue to use astrology as a guide on how to live. I've talked to teachers who treat their students according to their individual astrological signs. This is child abuse. It's beyond imagination. It's superstition, high-tech witchery.

SI: What do you see as the primary difference between astronomy and astrology?

J.H.: Simply put: astrology is subjective, astronomy is objective. Astrology is a religion, astronomy is a science.

SI: Astronomy has been called the "oldest of the physical sciences," while systematic astrology began in Meso-

potamia a mere 4,400 years ago. Yet the myth that astrology arose prior to astronomy persists.

J.H.: Astronomy comes first because you have to know the motions of the stars before you write a horoscope! And of course, we have carvings of the moon on bones, and cave drawings of the moon dating back to the Paleothic period, long before civilization emerged. These prehistoric people were studying the workings and paths of the planets and stars, not casting astrological charts!.

SI: Despite the best efforts of skeptics, science teachers, and scientists themselves, the popularity of astrology and other pseudosciences seems to increase with each passing year. What are your feelings about this?

J.H.: Part of this had to do with simple statistics: the total world population increases each year. Thus the amount of people who embrace the pseudosciences increases proportionally. More important, however, has been the development of electronic communications: radio, television satellites, computers, tape recorders, telephones, videos, and fax machines. While these technologies have greatly accelerated the proliferation of authentic science on a global scale, they have helped spread the pseudosciences as well. Demand creates supply, and soon we have organizations like Time-Life, who feed this hunger by publishing books on the paranormal.

SI: What is your opinion of Time-Life's promotion of the pseudosciences?

J.H.: They've lost all credibility, period. They're not interested in truth, they're interested in making money. The individual head executives of the companies like these pull down millions a year. They don't care that they're fleecing the public. They're laughing all the way to the bank!

SI: A majority of Americans say they have seen or believe in the existence of UFOs. What, in your opinion, is behind this phenomenon?

J.H.: Objects that are not easily identifiable to the majority of people! Look, there are lots of UFOs; lots of flying objects are unidentifiable. What's really behind all of this is that people want to believe in something that's bigger than themselves. Let's put it this way, most human institutions are full of hypocrisy. We have evangelists on the take, and so on. These institutions don't provide adequate answers to questions about the universe, and so people have to turn to something for comfort, for answers. As a skeptic and scientist, I naturally don't believe in things like astrology or UFOs. But at the same time, I don't think the spiritual rug should be pulled out from under people who are not ready, or who have nothing to replace their belief systems with. Many are simply not intellectually equipped to go beyond astrology and other spiritual belief systems. This is why I say that scientists must combine reason with compassion. If we lose our humanity we might as well join the ranks of magicians posing as psychics and other fakes.

SI: You spend a lot of time gazing skyward. Have you yourself ever seen what some would call a "UFO"?

J.H.: Sure. Then I go out, make some phone calls, do some research, and find out what it was! Inevitably, it turns out to be a combination of an atmospheric phenomenon and a celestial phenomenon. It can look quite spooky and quite convincing to the untrained or uncritical eye. Obviously there is a psychological factor involved in believing that these things are "flying saucers." *That's* what fascinates me, not so much the "UFOs"

themselves.

SI: There are those who would maintain that the universe is only 6,000 to 10,000 years old. Yet light is traveling to us from stars that are thousands, even millions of light-years from Earth. Why, in the face of such naked evidence to the contrary, is the religious creation model so appealing to so many?

J.H.: People believe what they want to believe, and if they have a belief system that tells them to believe such and such, no matter what the evidence says, they will. Most are not willing to risk jeopardizing their own value systems. If logic cannot dislodge personal prejudice, no matter how obvious the logic is, then you're dealing with a form of brainwashing, of indoctrination. Millions of people all over the world are inflicted with this "illness." A good example is the religious fundamentalists: some of these sects would literally kill each other in order to prove that "God is love"! Observation tells us that logic is not enough for some. If you take a brain and sufficiently condition it from birth, put a fear system into it, that person will fight to preserve that programmed belief. Subconscious fears will prevent that person from submitting to logic. To those who say the universe is only 6,000 years old, I say, the image they have of their god must be very small indeed.

SI: Christian mythology teems with astronomical, even astrological symbolism. What, for example, is behind the "Star of Bethlehem" theme?

J.H.: Funny you should ask that. I once did a five-hour talk show on this topic! Heraldic stars are political, pure and simple. In ancient times, shooting stars and comets were considered portents, omens of power. A ruler would hire astrologers to find signs of a great event in the heavens

"I'm very much into feeling a part of nature and the natural processes of the universe. I'm filled with the wonder of it all. In the end, isn't that the essence of both good science and true spirituality?"

that was supposed to have occurred at the leader's moment of birth, or during another important time in his life. If such an event didn't actually occur, the astrologers invented one. Often the appearance of a new comet could literally bring down an entire empire. Caesar and all of the other great emperors had a star heralding their births. Heraldic stars proclaimed great events like births, deaths, and marriages. As Shakespeare said: "When beggars die, there are no comets seen; The heavens themselves blaze forth the death of princes." It's a symbolic theme found in every ancient culture throughout the world. Even though I come from a Jesuit background myself, I don't take the Star of Bethlehem literally. For if this was indeed a historical event, then the church must accept the fact that it is promoting astrology.

SI: How is it that from Earth it looks to us as if the stars are moving away from us, yet Einstein showed that there is no center to the universe?

J.H.: Well, we start with the big bang. Then if we picture the universe as a big balloon with dots painted on it, the dots represent galaxies. Then, pretending that you're standing on one of those dots, you slowly blow up the balloon. You'll find that no matter which dot you "stand" on, all of the other dots appear to be moving away from you.

SI: The ancient Babylonians, Chinese, and Egyptians were all fairly sophisticated astronomers in their day. What are the most significant changes that have taken place in astronomy since the Bronze Age?

J.H.: Most important, the use of the telescopes. In 1610, Galileo saw the moons of Jupiter through a telescope and proved that we are not a geocentric system. Second, the development of spacecraft and computer technology. These things have fundamentally and forever altered the world in which we live, as well as our perception of it.

SI: Many ancient and medieval scientists paid a heavy price for viewing "God's creation" skeptically.

J.H.: I feel a great sadness for all those who were persecuted in the name of science, people like Giordano Bruno, who was burned at the stake because of his astronomical findings. I'm sure there were thousands just like him who perished silently, alone, in agony. Think of all the great minds throughout history who had put up with intolerant belief systems.

SI: On "Star Hustler" you are careful to separate physics from metaphysics, no doubt, in part, because the general public is often unaware of the line that separates science from pseudoscience.

J.H.: I was on a talk show in Philadelphia once, and the host asked me, "What do you think about Shirley MacLaine's new book?" I said, "I don't care to discuss it." He asked "Why not?" I said, "Because I *was* Shirley MacLaine in a past life and I've had enough of her!" Seriously though, this is a real problem. I'm horrified by these "crystal people," the "New Agers," the channelers. When I see some self-righteous televangelist telling people that cancer and other illnesses are the result of evil spirits and that they can only be cured by getting "closer to Jesus," I just boil over. I agonize over children or invalids who are trapped in homes with people like this. If someone is sick and suffering from an illness, it is an insult to have such ideas forced on them. I think that religious beliefs like these are a crime against the human mind, against human dignity. Unfortunately, we will always have unethical people preying on the gullible and desperate.

SI: What relevancy does astronomy and space exploration have for the average person?

J.H.: Most modern technologies are spinoffs of the American space program. Nearly all jobs today are related, in some way, to data gleaned from astronomical pursuits. And so I see thespace program as the most cost productive enterprise that humanity has ever undertaken. If we took the money set aside for NASA and gave it back to Congress, where do you think it would go, to the poor? Hell no, it would go to another bureaucracy. For one thing NASA is the least corrupt of all the agencies. To me, it's like the Holy of Holies. The bottom line is that astronomy creates jobs, improves the quality of life, and teaches us about the universe, and ultimately about ourselves.

SI: How likely is it that Earth is the only planet in the cosmos that contains sentient beings?

J.H.: I suggest you call Carl Sagan. I agree with him! Seriously, though, I believe that the universe is populated with sentient beings. We like to think our species is the only intelligent lifeform in the cosmos. I don't agree. I think that dolphins, gorillas, and chimps are pretty hip. Listen, there are planets everywhere in space. Logic says that "we are not alone."

SI: Some take the development of current astrophysical concepts like "wormholes," a "tenth planet," "baby universes," "imaginary time," and

"white holes" as a sign that empirical astronomy and metaphysics are moving ever closer together. Will science and religion ever become one?

J.H.: I don't think we'll ever reach the point where we talk about how many angels sit on the head of a singularity. Otherwise I defer to Stephen Hawking. I have a little altar to him in my room and I light a candle for him once a month . . . on the night of a full moon!

SI: Speaking of Hawking, do you have any heroes, or people who you personally admire?

J.H.: Well, aside from Sagan and Hawking, all of the people at the Jet Propulsion Laboratory and at NASA. These people are epic; they are mythologic to me. They are the great "spiritual" leaders of our time, and they're producing the great mythologies of modern-day society. My "religion" is the religion of JPL and NASA, it really is.

SI: Aristarchus, Ptolemy, Copernicus, Herschel, and many others saw incredible advances in astronomy during the time periods in which they lived. What, in your view, is the most exciting development in astronomy today?

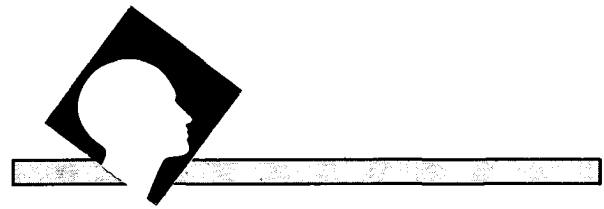
J.H.: Multi-mirror, computerized telescopes. Computers help us control telescopes and refine data in ways that we never could before.

SI: One last question. As a skeptic and a scientist, you maintain a highly critical view of established religion. Yet you have a Christmas tree here in your office.

J.H.: Actually, I don't celebrate Christmas in the traditional sense, and I don't see the tree as being exclusively Christian. The evergreen itself is a symbol of the winter solstice, of spiritual renewal, of hope for the future. I celebrate equinoxes too. You see, I'm an optimist, and so for me these are periods of rejuvenation, of rebirth, of the revitalization of life, just as they were to ancient peoples. I'll aways be drawn to things like Stonehenge, the Maya, medicine wheels. I still love to watch the sun rise in the morning and the moon rise at night. I see my own yard as a small Stonehenge: it marks the passing of the seasons. I guess you could say that, though I'm nonreligious in the orthodox sense, I'm *spiritual* in what I think of as the original meaning of the word. That is, I'm very much into feeling a part of nature and the natural processes of the universe. I'm filled with the wonder of it all. In the end, isn't that the essence of both good science and true spirituality?

Gabriel Seabrook is a writer on scientific and religious topics, founder of the Collegium for Cognitive Religiology, a member of the American Anthropological Association, and a board member of the Institute for Free New Thought. He is currently writing several books on the origins and development of religious thought. Jack Horkheimer may be contacted at the Miami Space Transit Planetarium, 3280 S. Miami, FL 33129; (305) 854-4244.

Book Reviews



Skepticism and Science In Mental Testing

A Question of Intelligence: The IQ Debate in America. By Daniel Seligman. Carol Publishing Group, New York, 1992. 239 pp. Hardcover, $16.95.

LEE LOEVINGER

Skeptical inquiry is a wise attitude, as the readers of this publication are aware, when confronted with such popular beliefs as those in astrology, telepathy, the prophecies of professional seers, and other aspects of the paranormal. But skepticism is equally useful in confronting many of the ideas that constitute conventional wisdom, particularly those that have some current popularity as being "politically correct."

Confronting the attitudes now current in the mass media and the popular press about mental testing is the mission that Daniel Seligman, a longtime editor and writer for *Fortune*, undertakes in *A Question of Intelligence.* In the Preface he states his assumption that most educated Americans, having been told repeatedly that IQ tests are biased against poor people and racial minorities, accept this conclusion, doubt that such tests do or can measure intelligence, and would be happy to have IQ testing abolished. He undertakes to demonstrate that all of these conclusions are wrong, but confesses that most readers will find his message "deeply troubling."

The stated purpose of the book is to present the IQ debate in terms comprehensible to the ordinary literate citizen, which is necessary because much of the debate has been conducted at a high level of statistical sophistication. As a preliminary, Seligman therefore starts out with an explanation of statistical correlation and standard deviation. After describing what it's like to take an IQ test, Seligman wades into the crux of the controversy, which is whether there is any single mental trait that can be measured and identified as intelligence. Athough some psychologists argue that there are numerous different mental faculties and that they cannot be meaningfully combined in a single score like an IQ, a recent book, *The IQ Controversy, the Media, and Public Policy*, by Mark Snyderman and Stanley Rothman (1988), reports that an extensive survey of psychometricians, the experts in the field, shows remarkable agreement among them that there is such a thing as general intelligence (usually identified as *g*) and that it is measured fairly well by IQ tests.

The real controversy about IQ tests arises from two facts that seem

incompatible with the political assumptions of democracy. These are: first, that there are reliable differences in average *group* scores when IQ tests are given to different ethnic and racial populations; and, second, that IQ is substantially, but not entirely, determined by heredity. Seligman examines both of these subjects in detail with an extensive but nontechnical and fairly balanced summary of the evidence.

One major conclusion is the scarcely debatable proposition that people with high IQs tend to do well in life. CEOs of large corporations, judges, research scientists, senior executives, and others in prestigious and high-paying occupations are almost always people of superior mentality (although sometimes of unpleasant personality). Furthermore, in almost every other kind of job the best predictor of performance is intelligence, not experience or formal education, or any combination of the two. At every level of job complexity, tested intelligence is a better indicator of job performance than any combination of credentials or tests of specific job knowledge. This is true of academic performance, as well as of employment occupations, since Scholastic Aptitude Tests (SATs) are quasi-IQ tests.

Although related in nontechnical, lucid, and easily understandable language, Seligman supports the data for these conclusions by endnote citations and an inclusive bibliography. However, the limits of the data are also noted. The correlations between IQ and success in various fields is not close to 1.0. For example, the correlation between IQ and income is about .50, which translates into a "coefficient of correlation" indicating that about 25 percent of the variability in income is traceable to IQ differences.

Finally, Seligman confronts the basic tension between the American commitment to the ideal of equality and the uncomfortable fact of intellectual inequality. He gives what I think are the clearly proper answers to those who are troubled by this apparent antagonism.

The equality of rights, the equality of everyone before the law, is not merely a legal principle but is founded on basic concepts of morality. It has nothing to do with individual equality or inequality in intellect or in any other personal characteristic. Indeed, to consider that inequality of personal abilities or talents is even relevant to the principle of equal rights is implicitly to assert that such factual inequality might justify unequal treatment, which is contrary to our fundamental political principles. Nobel laureate F. A. Hayek is quoted as saying: "It is of the essence of the demand for equality before the law that people should be treated alike in spite of the fact that they are different."

With respect to the demonstrable fact of differences in *average* IQ scores between different ethnic and racial groups, the appropriate response is also clear. The *range* of individual differences in IQ among the members of all groups that have been tested is approximately the same, although the group averages may differ by as much as a standard deviation. In other words, all racial and ethnic groups have extremely smart, as well as extremely stupid, members, with the majority clustered between these extremes, and group averages are no indication of intelligence (or any other characteristic) of any individual member of a group. As a matter of common sense, as well as political principle, this means that individuals should be judged and treated as individuals and not as members of a group. The final paragraph in Seligman's book is: "One major message

of the IQ data is that groups are different. A major policy implication of the data, I would argue, is that people should not be treated as members of groups but as individuals."

The most controversial issue concerning intelligence is the heritability of IQ. As Seligman says, passions are regularly torn to tatters over this issue. But two aspects are often overlooked. First, the debate is necessarily over how much of the difference between people is attributable to heredity, not the unanswerable question of what determines an individual IQ. Second, it is indisputable that both heredity and environment contribute to the variability of intelligence; and the only sensible question is the relative importance of the two elements. Although this debate is at least a century old, it has become more acrimonious since World War II, partly because of revulsion against Nazi atrocities, attributed to their false and distorted notions of genetics, and partly because of the growth of egalitarian political ideologies. Seligman summarizes and analyzes the accumulating evidence of numerous recent studies showing correlations of heredity and IQ variability ranging from .50 to .80.

In this wide survey of data and arguments there will surely be something to displease everyone. My own senior-citizen sensibilities are jarred by the chapter titled "Slipping: How Intelligence Declines with Age." That seems an unduly harsh description of my own mild episodes of absent-mindedness.

While the research is mainly academic, the subject of intelligence and individual variability is not of merely academic interest. Data on the subject are important for many of the social and political problems confronting the country today. A healthy skepticism toward current clichés and slogans is warranted. But in practical affairs conclusions must be reached and decisions made. For these the best guide we have is science and the data it produces. This book is a competent and inclusive survey of the best data science has produced to date in the field of mental testing.

Lee Loevinger is a Washington lawyer with a degree in psychology. He frequently reviews books on scientific subjects.

An Illustrated Guide to Quackery

American Health Quackery. By James Harvey Young. Princeton University Press, 1992. 299 pp. Hardcover, $24.95.

TERENCE HINES

James Harvey Young is the leading expert on health quackery in America, a topic long neglected by historians until his groundbreaking *Toadstool Millionaires* appeared in 1961. This excellent text, which told the story of American quackery up to the passage of the Food and Drugs Act of 1906, is now out of print. It was followed in 1967 by

The Medical Messiahs, which brought the story up to 1966. Both these titles were also published by Princeton University Press. *The Medical Messiahs* is available in a 1992 paperback edition, with a new Afterword.

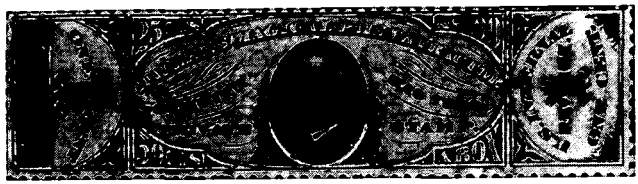
The present book is a collection of 14 of Young's essays on health quackery. Most have been published previously, although in some cases in shorter form or in obscure locations, such as local campus magazines. Thus their publication here is a valuable service in that they are made available to a wider audience. The essays run the gamut from the new-to-print history of the development of the author's interest in quackery (Chapter 1) to detailed and highly referenced chapters on the history of laetrile (Chapter 13) and "AIDS and Deceptive Therapies" (Chapter 14), also new to print. These last two chapters will be of special interest to readers of the SKEPTICAL INQUIRER.

Other chapters concern such varied topics as the sale of quack medicines intended for use on children, quackery by the federal and state governments (several chapters), and the psychology behind the success of quacks and the reasons patients fall victim to their claims (several chapters).

One important and recurring theme is Young's belief that the battle against quackery will never end. The crusades against quackery date back, in America, to at least the early part of the nineteenth century. At that time, the anti-quackery forces believed that once the public was better educated quackery would disappear. It didn't. As medical progress advanced in the twentieth century, again the hope was that quackery would nearly disappear. Clearly it hasn't. Young correctly points out in several chapters that the quack will always be able to take advantage of

the basic fact that humans are not very good at perceiving the real relationship between cause and effect. Thus the individual who goes to an arthritis quack when his or her pain is at its greatest and gets a copper bracelet (or whatever) will strongly attribute the following lessening of pain to the bracelet and not to the natural ups and downs of the arthritis that are the real cause. This is but one example of numerous instances of what might be termed information-processing failures, which will always allow quacks to exist.

To counter such quackery, Young argues, education may be important, but governmental regulation is vital. The government must impose at least the minimum standard of proved effectiveness on drugs that are offered for sale. And it must deal sternly with those who violate these standards. While these standards seem quite reasonable, they have recently been much opposed by the health-food industry and its now allied, and well-organized, lobbying groups. As the



The tax stamp that had to be affixed to Dalley's Magical Pain Reliever.

chapters on laetrile and AIDS make clear, these minimal standards have been and are in danger of being watered down in the face of hysteria over particular quack cures and specific diseases.

One additional feature of the book deserves comment. It is beautifully illustrated. In the nineteenth and early twentieth centuries, quack medicine manufacturers and retailers produced excellent examples of advertising art. Included were posters, labels on the actual boxes or bottles of the medicines, and even the tax stamps that had to be affixed to the product during the periods in which products were taxed (1862-1883 and 1898-1900). An example of such a stamp, issued by the company producing Dalley's Magical Pain Extractor, is shown here. The stamp is Scott number RS 4a. Printed in black, it is a beautiful example of the engraver's art, like so many other similar stamps. Young reproduces, alas not in color, numerous examples of posters, labels, and trade cards of quack medicine pushers. These are both lovely and chilling, as is the poster for Mrs. Winslow's Soothing Syrup for children during teething. It contained high levels of morphine.

—*Terence Hines*

Terence Hines is a professor of psychology at Pace University, Pleasantville, New York, currently completing a sabbatical at the University of Warsaw and Nenci Institute of Experimental Biology, Warsaw, Poland.

The Flat Error

Inventing the Flat Earth: Columbus and Modern Historians. By Jeffrey Burton Russell. Praeger, New York, 1991. 117 pp., plus 26 pages of plates. Hardcover, $12.95.

MONTY VIERRA

To celebrate the quincentenary of Christopher Columbus's arrival in the Western hemisphere, the U.S. Mint in 1992 produced both a five-dollar gold coin and a one-dollar silver coin. The Mint's flyer to prospective coin collectors reads in part:

> Spain, 1492 . . . The world is flat. Navigation of the seas is limited by fear of sailing over the "edge." . . . Conventional wisdom cautions

against sailing west, "too near the edge."

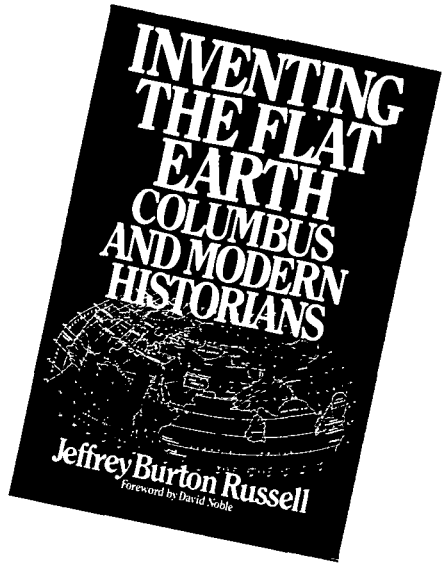
As the story goes, says Jeffrey Burton Russell in his *Inventing the Flat Earth*, early Greek discoveries showing the earth was a round ball had been shelved by the time of Christian ascendancy in the Roman Empire.

According to Andrew Dickson White's *History of the Warfare of Science with Theology* (1895), many early church fathers were against the idea of a round earth because it distracted people from thinking about God. Roman maps of the time portrayed the world as a flat circle circumscribed by a great river, Oceanus. In the sixth century B.C., Cosmas Indicopleustes of Alexandria, drawing on metaphorical passages in the Bible, such as Isaiah 40:22, Proverbs 8:27, and Job 22:24, conceived of the earth as a flat, rectangular box (Daniel J. Boorstin, *The Discoverers*, 1985: 108-109). Europeans of the eleventh century, Carl Sagan writes in *Cosmos*, "imagined a flat Earth centered on Jerusalem."

Throughout the twentieth century and right up until the 1980s, Russell writes, many textbooks and encylopedias subscribed to the view that people from the Middle Ages and well into the Renaissance believed the earth was flat, and Columbus set out to prove them wrong.

Yet it ain't so. Russell claims that what he calls "The Flat Error" is flat out an illusion. "The Error is not the alleged medieval belief that the earth was flat, but rather the modern error that such a belief ever prevailed" (p. 3).

Although the subtitle indicates the book will be about Columbus, actually Russell uses the bulk of this slim volume to set the world aright. In his second chapter, he examines the authors often cited as having propounded the flat error and shows that



they've either been misread or given more credit than they deserved. The Middle Ages, he notes, never lost sight of the discoveries of Aristotle and Ptolemy. "The sphericity of the earth," Russell quotes science historian David Lindberg, "was a central feature of theoretical dogmas as it came down to the Middle Ages" (p. 2). The oft-cited Cosmas was actually an eccentric "whose works were ignored or dismissed with derision throughout the Middle Ages" (p. 4).

The "flat" maps used by Romans and Christians alike simply projected the world in a way convenient for their purposes. Their maps didn't in any way contradict what the learned already knew: the earth was a sphere. "A future historian would be unjustified in concluding from [a modern Mercator projection map of the world] that twentieth-century people believed in a flat earth," notes Russell. Yet this is what many modern writers, particularly since the nineteenth century, have concluded about the people of the Middle Ages.

In fact, Russell maintains in his third chapter, the idea that medieval

Europeans believed the earth was flat was due in part to the subsequent battle over Darwin's theory of evolution. Progressivists and secularists claimed to find in the Middle Ages a time of reaction and irrationality, and they likened anti-evolutionists to supposed flat earthers of the Dark Ages. "The educated public, seeing so many eminent scientists, philosophers, and scholars in agreement, concluded that they must be right" (p. 46).

For Russell, the problem has come about because too many writers rely too much on secondary sources rather than on primary ones. The Christian church of the Middle Ages, he says, was not anti-science. Rather, many in the medieval church, such as Bede and Isidore, valued scientific knowledge; and at worst, others were simply indifferent to it where it did not touch on questions of morality and theology.

In addition to the evolutionists' need to repudiate their opponents, argues Russell in Chapter 4, there was a stirring picture of Columbus-the-courageous standing against the benighted churchmen. This image was painted by Washington Irving in his *History of the Life and Voyages of Christopher Columbus* (1828). The tale is "hard to resist, but it is fabrication, and it is largely upon this fabric that the idea of a medieval flat earth was established" in the modern English mind.

In his final chapter, Russell tries to sort out "why the Flat Error continues to persist." He gives five reasons: (1) we fail to check methods and sources; (2) we let biases outweigh evidence; (3) we fail to apply skepticism to our own worldview; (4) we assume our views are superior "to that of older cultures"; and (5) our fallacies and myths take on a life of their own.

Russell concludes by observing that we have a terror of the unknown and of meaninglessness—a terror of "falling off the edge of knowledge [which] is greater than the imagined fear of falling off the edge of the earth. And so we prefer to believe a familiar error than to search, unceasingly, the darkness" (p. 77).

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Creationism: Not Only Bad Science But Bad Religion

Scientific Malpractice: The Creation/Evolution Debate. By Ivan L. Zabilka. Bristol Books, Lexington, Ky., 1992. 160 pp. Paper, $9.95.

ROBERT A. BAKER

Although the gulf between science and religion has always been wide and deep, before 1960 there was little in the way of irreconcilable conflicts between science and the church. In fact, a number of steps were taken on the part of both the church and the scientific community to harmonize their differences and develop better

understanding and working relations between the black-garbed clerics and the white-coated specialists.

Things were going well between the two groups until the early 1970s, when a number of conservative Christians calling themselves Scientific Creationists decided to speak for all Christians. Their edict was simple: Christianity is only partially or inadequately understood if the creationists' position is not adopted. They insisted that the creation/evolution conflict is *the* strategic issue confronting the church today. They further insisted that a person not believing—as they believe—that the universe was created 10,000 years ago, has only an inadequate faith or has been duped by the scientific community. Since that time the creationists have succeeded in convincing a majority of Americans that their position is not only the correct one but one so important it ought to be presented in the public schools—as important as, and equal in validity to, the scientific concept of evolution.

Because most Christians believe that God is the originator of the universe (even though they have only the vaguest notion about how God may have gone about it), they—without knowing too much about *scientific* creationism—find themselves sympathetic to the idea. Ivan L. Zabilka has four advanced degrees in theology and the history of science. In *Scientific Malpractice*, a comprehensive and lucid little volume, he stresses that creationism is not only undeserving of the prominent position it has gained, it is also bad religion as well as bad science and in no conceivable way deserves to bear the label "scientific." In his words:

> Creationism is not a satisfactory alternative to the atheism implicit in some exposition of origins by evolutionary scientists. Creationism is an inadequate alternative because it rejects much of modern science without sufficient justification or adequate alternatives. Furthermore, the Creationist position is the result of an inappropriate method of interpreting the Bible. (p. 8)

Zabilka makes it very clear not only that the creationists are wrong but that his intent is to "focus upon the traditionally orthodox Christian position that science and religion are compatible and to provide a more adequate interpretation of the relevant biblical passages that allows us to keep the progress that modern science has made in understanding origins." Zabilka reaches these goals by presenting every one of the creationist arguments and then tearing it to shreds, showing that creationists fail to understand the very Bible they quote. This is typified by their use of the hermeneutic called "proof-texting," that is, they begin with a fixed conclusion and then seek quotations to support it. The result is neither good science nor good theology.

Zabilka then attacks the creationists' political objectives, showing that they have also distorted the core of the Christian faith (Christ's divinity and salvation) by focusing upon creation alone. Moreover, they also attack other Christian beliefs, make the church's views appear to be ridiculous, seek to impose their own views on society as a whole, and have succeeded in polarizing both the scientific and the religious communities into one of two choices: creationism or scientific atheism. Zabilka persuades us there is another alternative for believers and clearly states his position as both an Evangelical Christian and a scientist:

> . . . Whatever in science relates to the physical universe will be com-

patible with the revelation of God in the created cosmos, if both are properly understood. We may expect God to be consistent, not capricious." (pp. 16-17)

In the following chapter Zabilka points out that most creationists are not *scientifically* trained. They are, instead, *technologically* trained. Whereas the scientist is trained to think abstractly and theoretically in an exploratory and tentative fashion, the technologist is only interested in what works. Where the scientist sees a spectrum of possibilities, the technician is looking for the "one best solution." Creationists are predominantly technicians and, sadly enough, many engineers, computer experts, and clinical physicians also oppose evolution. As a result, with this base of respectability, the creationists have been able to gain a hearing among all of those already distrustful and suspicious of the indefiniteness and abstractness of formal science.

Not only are the creationists fundamentalist in their belief that the Bible provides the one and only correct picture of reality, they also believe the sole function of science is to provide the supporting evidence. Nor will the creationists tolerate differences—to differ means that you are wrong. The creationists have also separated themselves from the Protestant churches in general and publish only in creationist journals and with creationist publishers. None of the "research" they do is peer-reviewed or subjected to any criticism of any sort. In sum, the creationists—led by Henry M. Morris, director of the Institute for Creation Research (ICR); Duane Gish, associate director of ICR; Gary Parker and Richard Bliss, also of ICR; Kelly L. Seagraves of the Creation Science Research Center; Paul Ellwanger of the Committee for Fairness in Education, as well as Harold S. Slusher, John W. Moore, Martin E. Clark, W. L. Wysong, and Robert E. Kofahl—in Zabilka's words, "appear to be scientifically, socially, and religiously narrow." This description is fully substantiated by their frequent confusion of biological evolution with social Darwinism. They also see evolution as the fountainhead of other assumed evils, such as relativism, mechanistic and positivistic philosophies in the sciences, and determinism in philosophy. Their major beliefs include the following: (1) the Earth is only about 10,000 years old; (2) human beings and the apes are not related in any way; (3) fossils are all the result of the universal flood several thousand years ago; (4) the obivous complexity of life is by simple probability impossible—the inherent design necessitates a designer; (5) the universe, and everything in it, was created from nothing; and (6) God, not matter, is eternal.

In the following chapter Zabilka reviews the social and political implications of creationism, tracing the history and the conduct of the Scopes Trial (1925-1927) as well as its aftermath. Since those days, the creationists have amassed a large following with hundreds of thousands of Americans and numerous libraries on their mailing lists. Their total number today may be as high as 18 million. As for their influence, they have been instrumental to introducing legislation in at least 35 states, seeking to legalize the teaching of creationism alongside evolution in the science classroom. In Arkansas and Louisiana they secured passage of such laws, which were challenged in the courts and struck down. They have influenced textbook adoption in several states, especially Texas and California, although in California their power seems to be eroding.

Zabilka next addresses the scientific arguments of creationists in depth and finds them wanting on each and every issue; the problem of "kinds," the fossil record, the origin-of-life problem, the evidence of geology, astronomy, and physics, as well as the creationists' misuse of probability, the rules of evidence, and just about every other tool and technique of the scientific process. Creationism is not in any way science. What they must be credited with, Zabilka says, "is marvelous political skill and immense success in getting science debated in the public arena."

Zabilka next shows how the creationists have not only misinterpreted the Bible but have also caused embarrassment to the Christian faith. As for their political/legal strategy, discussed fully in Chapter 6, it is clear that creationist political influence is waning. This does not mean, however, that their strategy has not succeeded in arousing antagonism toward science and causing many to regard all science as a potent threat to traditional values. Although creationism cannot win on the basis of its scientific merits, Zabilka warns, it can cause havoc in the area of public moral attitudes. For example, the Christian Heritage College in California and Liberty University in Virginia, both of which turn out creationist public school teachers, have recently been accredited and show an increase in influence at the local level.

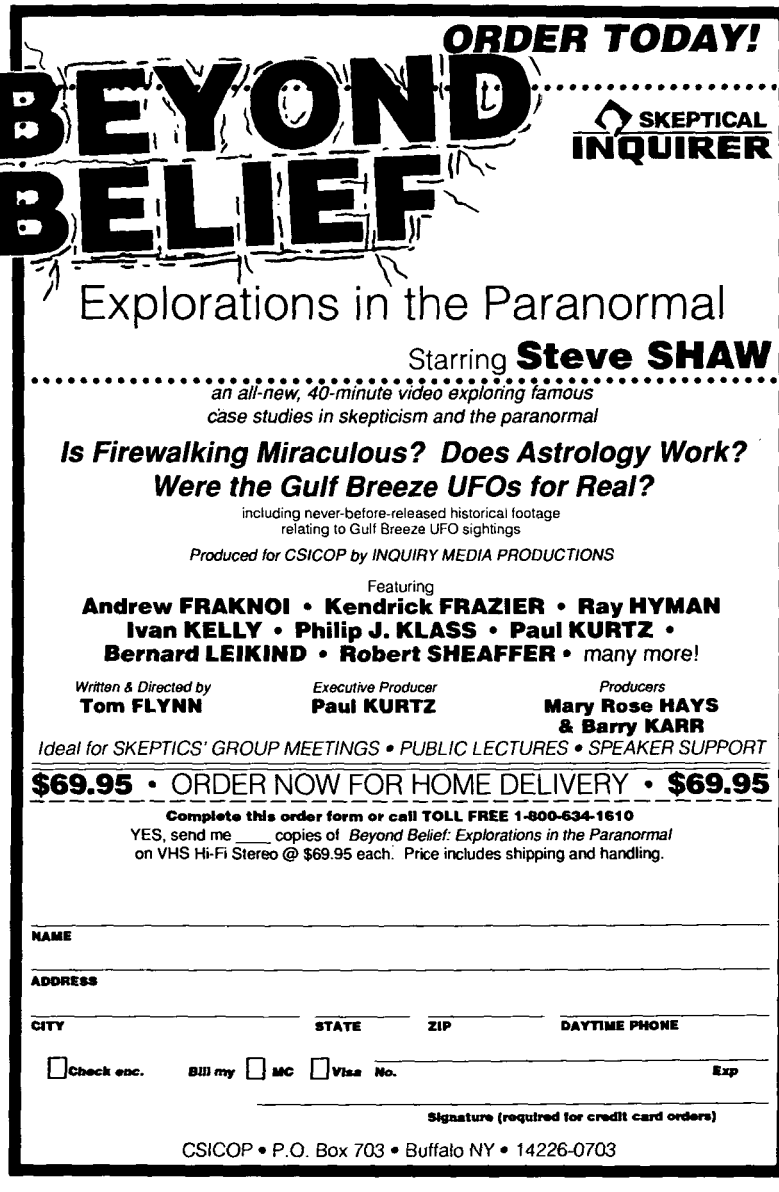
Although Zabilka's sympathies for science are clear and unmistakable, he warns against the kind of emotional, sarcastic, and belittling outbursts that have occasionally appeared in some of the skeptical journals. He also notes that some scientists seem unable to differentiate magic and superstition from theology and philosophy. When they do this, Zabilka cautions, they play into the dogmatic hands of creationists and commit the same sins. Zabilka also makes it clear that one of the reasons creationists continue to receive a public hearing is that evolution itself is, in no way, free of difficulties. There are serious problems with strictly mechanistic and deterministic views as well as with "scientism." He also stresses that disagreements and disarray among the evolutionists themselves have played into the creationists hands.

Zabilka, in his closing arguments, makes a number of comments and recommendations that everyone interested in the creationist/evolution debate should ponder: (1) The Scriptures, properly interpreted, do not require an anti-evolutionary stance (2) Scientists need to recognize their own metaphysical assumptions. (3) Christians have an obligation under American law to keep the metaphysical debate out of the classroom. (4) Creationism is not science and should not be seen as a science. (5) Both Christians and scientists should avoid all arrogance. (6) Natural revelation and special revelation do not conflict, although interpretation of them will. (7) The truth is more difficult to discern than either creationists or scientists would have us believe. A flexible interpretation of both the Bible and scientific results, Zabilka believes, is most likely to produce satisfactory results in the long run.

While there are lengthier, more comprehensive, and more authoritative books about creationism from the scientific point of view, e.g., Kitcher's *Abusing Science: The Case Against Creationism* (MIT Press, 1982), McGowan's *In the Beginning . . .* (Macmillan, 1983), Niles Eldredge's *The Monkey Business* (Washington Square Press, 1982), and D. J. Futuyma's *Science on Trial: The Case for Evolution* (Pantheon Books, 1982), there are few, if any,

as clear, concise, yet also as thorough as Zabilka's. Written from both *the scientific and religious point of view*, Zabilka's arguments are effective, sensible and unusually persuasive. They also remind us of a remark made by Ann Druyan in her new book with Carl Sagan. Choosing her words carefully, she stated, "I think that science in a way is the highest form of piety, because it is always whispering in our ears, 'Remember, you could be wrong.' " Zabilka would agree.

Robert Baker is professor emeritus of psychology at the University of Kentucky.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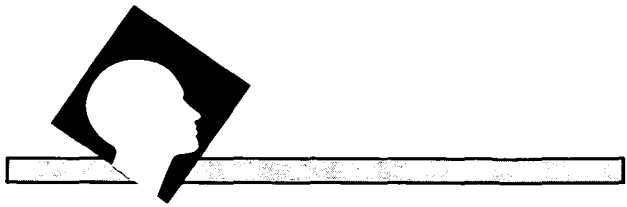

Aping Language. Joel Wallman. Cambridge University Press, 110 Midland Avenue, Port Chester, NY 10573. 191 pp. $47.95 hardcover, $13.95, paperback. A critical assessment of each of the recent experiments designed to impart a language, either natural or invented, to apes. Compares the performance of these animals in experiments with the course of semantic and syntactic development in children, examines what is known about our own species' language-learning attributes and the communication of nonhuman primates in nature.

Empiricist Research on Teaching. John H. Chambers. Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061. 1992. 282 pp. hardcover. Presents a novel thesis that there has been a pervasive misunderstanding in research on teaching. In attempting to be *scientific*, researchers have been *empiricist*. Moreover, because they have used a very restricted kind of empiricist method, their results have been only moderately useful and research needs to be radically modified.

The Kekulé Riddle. John W. Woltz, ed. Cache River Press, Rt. 3, Box 239C, Vienna, IL 62595. 1993. 329 pp. $78.00, hardcover. Did the chemist F. August Kekulé conceive the cyclic structure of benzene, as well as his theory of carbon chains, in his dreams? This revisionist book re-examines how, why, and if Kekulé merits this reputation, a reputation that often seemed unfounded. An international group of experts, brought together for a special meeting of the American Chemical Society's Division of the History of Chemistry, contributed chapters examining specific aspects of the controversy. The editor says that in his opinion "the riddle has now been solved."

The Mask of Nostradamus. James Randi. Prometheus Books, Buffalo, N.Y., 1992. 256 pp. $16.95, paperback. Paperback edition of book published in hardcover by Scribner in 1990. This is Randi's in-depth biography of the 16th-century astrologer and physician. Randi shows how contemporary beliefs in magic and astrology adulterated the science of the time. He exposes some of the tricks Nostradamus used to make his predictions seem authentic and the rationalizations used by followers throughout the centuries to make the prognostications "fit" subsequent events.

Miracle Mongers and Their Methods: A Complete Exposé. Harry Houdini. Prometheus Books, 700 East Amherst Street, Buffalo, NY 14215. 1993. 240 pp. $15.95, paperback. A paperback edition of the work in which the legendary magician and illusionist reveals the techniques of fire-eaters, sword-swallowers, stone-eaters, reptile-defiers, and other early masters of deception. The Foreword is by James Randi.

Mysterious Realms. Joe Nickell with John F. Fischer. Prometheus Books,

700 East Amherst Street, Buffalo, NY 14215. 1993. 221 pp. $23.95, hardcover. Authoritative examination of ten prominent "mysteries" that persuaded many people that supernatural events happen. Nickell and Fischer use their skills and experience in historical document examination and forensic research to examine a variety of strange claims: Has the government concealed evidence of UFO visitations to Earth? Is there really a miracle of congealed blood in a Naples cathedral? Are crop circles the work of unknown visitors or clever hoaxers? Did Lee Harvey Oswald assassinate J.F.K. or was it a Soviet look-alike? Is a Kentucky house really haunted by a "gray lady's ghost"?

The Mythmaker's Magic. Delos B. McKown. Prometheus Books, 700 East Amherst Street, Buffalo, NY 14215. 1993. 180 pp. $23.95, hardcover. The head of the Philosophy Department at Auburn University looks behind the "illusion" of "creation science." McKown has aimed his book "at the kind of intelligent, reasonably open-minded, public-spirited people who serve on the nation's school boards," as well as at science teachers and scientists in general. Puts scientific creationism into historical perspective, examines its legal and constitutional strengths, and suggests tactics for thwarting its influence in public education.

—*Kendrick Frazier*

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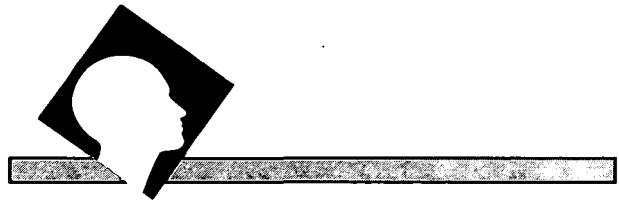

Coleman, Julian, and David Concar. "Pouring Cold Water on Lorenzo's Oil." *New Scientist*, March 6, 1993, pp. 23-24. The movie *Lorenzo's Oil* relates the experience of two parents' heroic quest for a cure for their son's degenerative disease. They felt that a dietary supplement, Lorenzo's oil, was responsible for halting the disease. This article tells the other side of the story. A neurologist who has conducted clinical trials with the substance calls the movie "an abomination" and attributes Lorenzo's long survival to natural variability in the severity of the disease. Many other medical researchers also feel the movie claims too much.

DeWire, Elinor. "Don't Call Me Ernie!" *Mariners Weather Log*, 36(40): 32-35, Fall 1992. The New London Ledge Lighthouse is supposedly haunted by the ghost of a former lighthouse keeper who committed suicide there.

Diamond, John. "News from the Front." *Times Saturday Review*, 25, January 2, 1993. Columnist Diamond says that the best argument against psychics, spoon-benders, and so on is the trivial nature of their concerns. Why do the spirits spend their time predicting unimportant events when they could be warning of famines, etc.?

Eve, Raymond A., and Francis B. Harrold. "Scientific Creationism and the Politics of Lifestyle Concern in the United States." Chapter 8 in B. Misztal and A. Shupe, eds., *Religion and Politics in Comparative Perspective*, 97-109. Prager, New York, 1993. Examines the creationist movement and relates it to the concerns of cultural traditionalists upset by a wide range of modern sociopolitical trends they find disturbing.

Ferraiuolo, Perucci. "Warnke Calls Critics Satanists." *Christianity Today*, 36(13): 49-52, November 9, 1992. Mike Warnke, whose prominent claims of having been part of a satanic conspiracy have been attacked by Christian organizations as untrue, is having financial problems. He accuses his critics of being part of a satanic conspiracy against him.

French, Sean. "Diary." *New Statesman & Society*, 6(235): 8, January 15, 1993. Columnist French argues that astrology is not only nonsense, but harmful, because of the worldview it creates.

Hill, Lyda, and Nancy Oliver. "Technique Integration: Therapeutic Touch and Theory-Based Mental Health Nursing." *Journal of Psychosocial Nursing*, 31(2): 18-22, February 1993. In Therapeutic Touch, nurses assess "the client's energy field" by holding their hands a few inches away from the skin and trying to refocus the energy. This article attempts to apply TT to mental-health problems.

Hutchings, Vicki. "If They Ruled the World." *New Statesman & Society*,

6(235): 12-13, January 15, 1993. A decidedly skeptical report on the First International Conference that exposes a global deception. Speakers reported on conspiracies behind UFOs, the Illuminati, the JFK assassination, etc.

James, Ronald M. "Knockers, Knackers, and Ghosts: Immigrants in the Western Mines." *Western Folklore*, 51(2): 153-177, April 1992. A long scholarly study on the Tommy-knockers, legendary haunters of the Cornwall mines, who managed to make it into the mining legends of the American west.

Klemperer, Frances. "Ghosts, Visions, and Voices." *British Medical Journal*, December 19-26, 1992, pp. 1518-1519. Note pointing out that hallucinations need not be pathological; they may often be simple perceptual mistakes.

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Mayor, Adrienne. "Derelict Ships." *Mariners Weather Log*, 36(4): 4-10, Fall 1992. Ghost stories like "The Flying Dutchman" began with genuine encounters with derelict ships, some both bizarre and dangerous.

McCarthy, Paul. "Cryptozoologists: An Endangered Species." *The Scientist*, 7(1): 1, 4-5, 7, January 11, 1993. Some scientists have had their careers stunted because of their involvement in the International Society of Cryptozoology. A report on the work of some of the society's members, including the discovery of two genuine new species.

O'Neill, Graeme. "There's No Science Like Pseudoscience." *Search*, 23(8): 235-236, September 1992. Scientific and environmental journalists have to write about controversial topics. O'Neill discusses the problem of maintaining objectivity while reporting all sides of such issues as dioxins, the greenhouse controversy, Noah's Ark, and chemical carcinogens.

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Rosellini, Lynn. "The Case of the Weeping Madonna." *U.S. News & World Report*, March 29, 1993, pp. 46-55. Asks, "Are the extraordinary events in a Virginia suburb a miracle or a hoax?" This report on the latest highly publicized "weeping madonna" case includes a sidebar, "Charlatans in the Church," about James Randi's exposure of faith-healer Peter Popoff and a photo and quotations of skeptical physicist (Lawrence Berkeley Lab) and magician Shawn Carlson: "I could walk through and airport, never having been there before, and make virtually anything cry without touching it. I can also make statues cry for days to weeks on end and keep them crying without anyone around. And these techniques have been available for hundreds of years." Chip Denman of the National Capital Area Skeptics, whose offer to investigate was declined by the church, is also quoted.

Sagan, Carl. "What's Really Going On?" *Parade Magazine*, March 7, 1993, pp. 4-6. A thoughtful examination of the phenomenon of reports of abductions by alien spacecraft. Goes into the nature, commonness, and causes of hallucinations, the cultural antecedents of, and influences on, today's abduction stories, and the absence of any physical evidence that such abductions really happen. "What is more likely," Sagan asks, "that we're undergoing a massive but generally overlooked invasion by alien sexual abusers, or that people are experiencing an unfamiliar mental state?"

Siemens, David F. "More Problems With Flood Geology." *Perspectives on Science and Christian Faith*, 44(4): 228-235, December 1992. A Christian philosopher argues against creationist ideas, such as postflood mountain-building and a pre-flood canopy of waters.

Sigmon, Becky A. "Physical Anthropology in Socialist Europe." *American Scientist*, March-April 1993, pp. 130-139. Finds that scholars in socialist Europe were limited not only in the questions they could ask but in the answers they could consider. "The Stalinists rejected scientific theories and scientific evidence that did not conform to political ideology," notes the author. The worst manifestations took place in psychology, biology, and anthropology. The belief that there could be a biological basis for behavior was called *biologism* and was considered the ideology of the enemy. These ideological constraints evaporated in 1989, and have been replaced now by financial constraints.

Weldon, Fay. "Down Among the Scientists." *New Scientist*, December 19-26, 1992, pp. 40-41. A good-humored but still pointed criticism, from a writer and representative of the liberal arts, of "scientism." Scientism is the implied belief in the omnipresent competence of science, combined with the notion that the "ethics" of science is identical to personal and social morality—or, as Weldon puts it, "if it's science it must be right." She's actually responding, "waving a white flag," to criticisms by scientists of an earlier article on the subject she'd been asked to write for the *Daily Telegraph*. The core of concern here is scientific hubris and the unbecoming lack of humility exemplified in some scientists' thinking. It best be avoided, and reading such constructive criticisms is one way to see why.

—*Kendrick Frazier and Robert Lopresti*

Curiosity and Compassion

Science cannot develop unless it is pursued for the sake of pure knowledge and insight. It will not survive unless it is used intensely and wisely for the betterment of humanity and not as an instrument of domination. Human existence depends upon compassion and curiosity. Curiosity without compassion is inhuman; compassion without curiosity is ineffectual.

—MIT physicist Victor F. Weisskopf, "Science Yesterday, Today, and Tomorrow," presented at the 159th Meeting of the AAAS, Boston, February 11-16, 1993.

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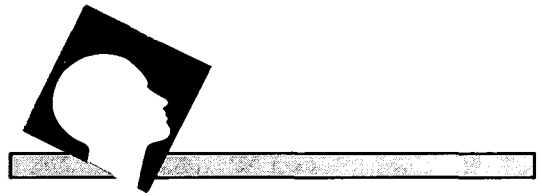
Follow-Up



Samoan Hoax, Margaret Mead, and Cultural Relativity

Martin Gardner's article "The Great Samoan Hoax" (SI, Winter 1993) provoked considerable reaction. We here publish representative commentaries from three anthropologists and follow them with a response from Gardner.

JOHN R. COLE

I was surprised by Martin Gardner's article for a couple of reasons. I believe he may rely too strongly on the case made against Margaret Mead by Derek Freeman with Mead now dead and unable to reply. More important, I question his rather extreme and puzzling definition of the "cultural relativism" taught by anthropologist Franz Boas and Gardner's assertion that this idea was at great odds with John Dewey's philosophy.

In fact, Franz Boas and philosopher John Dewey co-taught courses at Columbia University on the nature of culture and the relationship between education and biological determinism. Both were adamant cultural determinists in the "nature-nurture" argument. Both men are widely regarded as founders of the modern "humanist" movement, which emphasized human behavioral plasticity and the possibility of improving society through education, defining morality without recourse to divine or biological absolutes, and by learning from diverse cultures rather than condemning the "other." Boas was one of the leading spokespersons for racial and religious tolerance until his death in 1943; like Dewey (and unlike most professional scholars) he devoted huge amounts of time and energy to public writing, radio interviews, advising popular movements, and so forth, on the need to respect cultural differences without assuming the superiority of white, Western European mores—*while at the same time tirelessly campaigning against racism, sexism, culturally imposed inequality, imperialistic warfare, and many other "progressive" issues; he worked extensively with Dewey and others on these matters.* Boas in fact died at a luncheon he was helping to sponsor to support Paul Rivet and the French Resistance.

I onced asked Boas's daughter Franziska about the possible conflict between her father's relativism and his political activism. She replied, in essence, that her father taught his students what he taught his family: not to judge people harshly because they differ from your culture, but to defend human dignity and oppose suffering—by taking the lead in your own society, showing that doing "right" does not get defined as just doing things the way "normal, middle-class Europeans do them," one gains the authority to criticize harmful cultural practices in other cultures as well.

Cultural relativism is such a cor-

nerstone of the skeptical, humanistic movement that I do not like to see it portrayed otherwise. It certainly has its problems, and at worst it can be used by a Jerry Falwell to slander any form of respect for other peoples' beliefs, but that certainly was not Boas's approach or goal. It was not the "moral relativism" Gardner implies.

Margaret Mead did, in fact, say some oversimplified things in public about the absoluteness of cultural relativism. I challenged her on this a couple of times when I was in one of her classes and was not satisfied with her "public," pat answer, which seemed to imply that "all behaviors are equal." But this was not her view in serious conversation or in her long life of work for specific goals, such as opposing war, sexism, and inequality.

Some—maybe a lot—of the critique of her book *Coming of Age in Samoa* is accurate. Mead was indeed looking for evidence that there were people a lot different from her own, happier with their sexuality, and proof that "normal" was not limited to the supposed Victorian ideal. Boas did send her in search of evidence to demonstrate that the Euro-American middle class was not the only viable way of life, and she was undoubtedly too uncritical of informant information.

Without defending everything in *Coming of Age in Samoa*, in her last years Mead and some of her allies in fact made some serious counterarguments. (Freeman's complaints and others like them were in the wind long before he published them.) Sadly, she confided possibly important information to friends while maintaining that it was important not to "stoop to reply." The result, of course, leaves her reputation tarnished probably more than it should be. At least one of her long-time assistants told me of her frustration at living up to her promise not to "hit back." Gardner is correct that this was unscientific conduct, but silence is not quite the same thing as agreement with charges or the inability to reply.

Incidentally, Gardner does not mention that one of the factors that led anthropologists to defend Mead so strongly was Freeman's seeming to save his attack until after her death when he had been nursing it long before. Also, there was resentment that he seemed to break the story sensationalistically via press conferences and press releases with comments along the lines of how his book was going to put an end to Mead's reputation once and for all. Many thought his success on the talk-show circuit made his claims look less scientific (although Mead was a champion on that route). Instead of "adding to an earlier ethnography," or "revising" it, or correcting errors (not everything in it was wrong), Freeman made it his mission to destroy the reputation of the book's recently deceased author.

In any case, I'm troubled to see this blanket denunciation of cultural relativism. Boas and Mead and others have used the concept to advocate tolerance of diversity without defending human suffering, which is, of course, a widespread human norm.

John R. Cole is an anthropologist at the University of Massachusetts, Amherst.

THEODORE SCHWARTZ

Such is my great respect for Martin Gardner, whom I identify with skepticism, that I was grieved to see the lapse in his own skepticism in "The Great Samoan Hoax." The article shows what happens when skepticism is applied to only one side of a polemic. I do not see evidence of close *critical* reading

of Derek Freeman's (1983) book and certainly not of Margaret Mead's (1928; 1930) two books on Samoa. I wrote one of the many reviews (Schwartz 1983) of the Freeman book (together with Mead's), striving to be objective and balanced (an aim that I thought needed no apology in this journal). Mead's second field trip was to Manus, in what is now Papua New Guinea, a few years after her work in Samoa. When she returned to Manus 25 years later (1953), I worked with her as a field assistant while doing my own doctoral research. I was neither her student nor an acolyte; we both agreed and disagreed on many things, but I observed her work at firsthand and was able to check her earlier work in Manus. I do not find it credible that she was so mistaken or taken in as Freeman argues and Gardner swallows.

One could write Freeman's book by negating every sentence in Mead's. I will not repeat here what I wrote in my review. There is much more in her book than the tales of trysts to which Gardner refers, which were to some degree institutionalized as a part of Samoan and Polynesian culture. The idea that the anthropologists' informants (now correctly referred to as "associates" and "collaborators") systematically lie to the gullible anthropologist over an extended period is a story that I have heard quite often, not just with respect to Mead. We are aware that people often tell us what they think we are eager to hear, although of course this doesn't apply to Freeman and those who interviewed Mead's informants 50 years later.

What we study disappears before our eyes over a few decades. I have made a dozen field trips to Manus over the past 40 years. There is much that I was once told and can document that would now be denied, as people construct a past suited to present beliefs and values. What is remarkable is that some of pre- or early colonial native culture survives, although often underground or under a deep reluctance to speak of past customs so thoroughly condemned by Christian modernity. Freeman's own book is not without contradictory indications with respect to Samoan sexual morality. Mead's other book on Samoa, like her second book on Manus, is a scholarly monograph on kinship and social organization. I am sure that there are both errors and omissions, as there are in her Manus works. They are nevertheless remarkable for the time in which they were done.

That Mead was highly intelligent, quick, perceptive, and phenomenally energetic cannot be taken from her. Gardner's inclusion of mere gossip, which followed her wherever she went, that she took native lovers, that she danced bare-breasted, does him no credit. Freeman convinces me that Mead gave a one-sided picture of Samoan culture and temperament (as does he). She was partly mistaken. Having labored for decades to prove this, it seems odd that Freeman could now offer, and Gardner accept, the idea that she was the "hoaxee" rather than the "hoaxer." I believe that she was neither, but rather that she was partly in error, biased by a wish to prove her point and dramatize it as was her wont. So, for example, she failed to give a full account of Samoan aggressivity. She discounted the Samoan cult of virginity. (I argue it is likely that Freeman has done the opposite.)

As for the elementary discourse on human nature, spare us! Freeman's and Gardner's "interactionism" is at a level that no sane person denies—and when it gets more specific, as in some of the claims of sociobiology,

Freeman also balks. The "biology" that Boas (a person of towering stature in the founding of anthropology) combated was *not* that of a generic biological substrate to human behavior and culture, but rather that of racism and eugenics that would explain the differences among cultures (and individuals) by biological difference. Freeman and Mead, were it not for his quest to redeem the Samoan people from her depiction of a relaxed sexuality, would fully agree in rejecting the idea that differences between Samoan and American behavior and culture were biological.

Further, Boas and Mead believed that when any universalistic characterization of human nature was offered, it was subject to what Mead called the "yes, but the Eskimo . . ." test. The issue that Mead addressed was not whether puberty was a universal biological event, but whether adolescence inevitably had the characteristics of "storm and stress" attributed to it by psychologists like G. Stanley Hall. Puberty here is the near-genotype; adolescence is phenotypic, what particular cultures make of puberty. Even if Mead were wrong about Samoa, the point is solidly established by many other studies in Polynesia and elsewhere that the concomitants of puberty are variable, that cultures run the gamut from sexual permissiveness to repressiveness, as has our own Amer-European culture in different subcultures and historical periods. The only biological determinism that this would offend would be a straw man as phoney as the cultural determinism that Freeman and, alas, Gardner choose to engage.

Any sensible formulation of cultural relativism and cultural determinism would see it for what it then was, a well-founded antidote to racism and ethnocentrism. Gardner suggests that the values by which we condemn genocide or infanticide must be grounded in the biological base of human nature. I would suggest that these values are emergent, and as yet incompletely so, from cultural evolution.

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FRANK LEE EARLEY

I greatly appreciated Martin Gardner's article. As Karl Popper said, "The habit of calling its own findings into question and attempting to disprove them is the core of scientific work." From that perspective, Gardner has done notable service on the Margaret Mead issue and on many previous occasions.

There is, however, one troublesome aspect of the article: Gardner's treatment of cultural relativity. He takes the most extreme possible view in citing Boas ("there were no universal human values"), erroneously equates that position with cultural determinism, and then implies that anthropology adopted the whole package.

In fact, the anthropological approach to cultural relativity is quite different. Cultural relativity begins

with the recognition that there are many ways of solving human problems; and it is the task of anthropology to research and understand all of them. If the task is to understand, then adopting a-priori judgments about what is good or bad becomes an impediment to the study. We can understand any cultural behavior only if we find the assumptions on which it is based. If an American anthropologist begins a study by expecting that the target population ought to behave like Americans, and that other behaviors are bad, savage, primitive, childlike, or ignorant, then what chance would the researcher have of learning why Aztecs sacrificed their best warriors or why Americans ask their best athletes to maim themselves in football games?

From the understanding about cultural assumptions and the systems of logic that drive human behavior, anthropologists can define not only the limits of human behavior (the cultural universals specified by Franz Boas, Clark Wissler, and others in the 1930s and since), but the beneficial or harmful consequences that stem from various systems or elements of culture. From these definitions and insights comes the large, growing, and very useful practice of applied anthropology.

Applied anthropology, as Gardner is probably aware, is one of only a few disciplines that attempt to make improvements in the human condition by blending academic research and practical application of social knowledge. The Society for Applied Anthropology (SAA) in 1948 adopted an elaborate and very useful statement on ethics. The ethics statement has been revised several times since then and has never assumed, as Gardner blithely asserts, that there are no universal values. The statement deals specifically with the anthropologist's obligations to science, to human dignity and rights, and to the communication of knowledge and research.

This ethical and universalist approach to cultural studies, and the very vigorous debate in anthropology over the Mead-Freeman controversy, indicates that Gardner has misunderstood the anthropological use of cultural relativity.

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Martin Gardner Responds

Several times John Cole faults Freeman for publishing his book on Mead after she died. This seems unfair. Holding the book until after her death was an act of kindness. Had he published it earlier, Mead admirers would have accused him of bashing a sick, elderly woman, perhaps contributing to her demise.

Rather than continue to defend Freeman, or to repeat criticisms of Mead I have made elsewhere (especially in my book *The New Age*, where I focus on her lifelong beliefs in psychic phenomena and her late in life conviction that we are being observed by aliens in flying saucers), let me try to erase some ambiguity about the term "cultural relativism."

Terms with a strong meaning at one time often grow weak over the years. If cultural relativism is taken today to mean only that cultures vary enormously and that one must not judge an alien culture by the standards of one's own, then of course everyone should be a cultural relativist. However, when young Mead wrote about Samoa, the term had a more controversial, philosophical meaning. It

denied the existence of "cultural universals"—meta-biological needs that were common to humans everywhere.

In his essay "What Is Human Nature?" Bronislaw Malinowski answered by defining it as a set of such needs as breathing, eating, drinking, sex, rest, activity, sleep, micturition, defecation, escape from danger, and avoidance of pain. As I pointed out in an early essay "Beyond Cultural Relativism" (reprinted in my *Order and Surprise*), the amusing thing about this list is that it gives human nature to a cow.

It was an easy step from such a narrow concept of human nature to the notion that the task of cultural anthropology is not to decide what is good or bad about cultures, but merely to study their multifarious patterns. In actual practice, however, cultural relativists constantly issued value judgments that crossed cultural boundaries. Boas and Dewey were indeed friends who shared lofty ideals about tolerance, democracy, and world progress, but these ideals rested on different philosophical foundations. Consider racism, such an integral part of our Southern culture. When Boas attacked it, on what podium did he stand? Pinned down, he would have been forced to say that his opinions and actions emerged from his own cultural background, not from values that could be defended objectively.

Melville Herskovits once defined cultural relativism as "a philosophy which, in recognizing the values set up by every society to guide its own life, lays stress on the dignity inherent in every body of custom and on the need for tolerance." Admirable words, but as one reviewer commented, dignity and tolerance are not accepted values even in American culture.

Similar contradictions can be found in the writings of dozens of anthropologists of Boas's day. Ruth Benedict's *Patterns of Culture*, for instance, includes a vitriolic attack on the mores of American business tycoons. She considered them worse than hardened criminals. True, their behavior is the product of a business subculture, but it never occurred to Benedict that her attack ran counter to her book's main theme.

When Clyde Kluckholn attacked cultural relativism in his paper "Ethical Relativism: Sic Et Non," he was roundly chastised by colleagues. There are, he said, common human needs and motives "so deep and so generic that they are beyond the reach of argument." Calling attention, he continued, to the diversity of cultural behavior is an excellent way to combat ethnocentrism, but the more important task now for cultural anthropology is to search for common elements within the diversity—elements that can become the basis of a worldwide naturalistic ethics.

This was Dewey's view. It is Karl Popper's view. I suspect it is the view of all three letter writers. If so, it would be a clearer use of language if they would stop redefining cultural relativism and instead recognize it as an extreme philosophical view that long ago had its day. □

Forum

The Well-Run Universe—Fact or Fancy?

RALPH ESTLING

"Man goes missing with ear on thigh" was how they headed the medical editor's item in *The Independent*.

It was a simple, everyday tale of plastic surgery. A man had had his ear bitten off in a scuffle and the surgeons stitched it, in a provisional way, onto the side of his leg to maintain its blood supply while they waited for the wound to heal before reattaching the ear to its normal spot, a standard operational procedure. But the man never returned. A man with an ear on his thigh who goes missing is definitely gilding the lily of the absurd. It is an extravagance we can do without, inordinate, overdone, *de trop*. It is not the sort of thing one expects to find in a Well-Run Universe.

The matter of the missing man and his transported ear insinuated itself into my thoughts (if one can so dignify what was going on in my mind) as I sat reading Paul Davies's latest book, *The Mind of God*. I hope God's mind isn't as easily sidetracked as mine. One has, over the years, come to expect rather more from God.

At the close of one of his *Fables for Our Time*, James Thurber decided that it is better to be hen-dubious than cock-sure. On the question of God and Universe I tend toward the hen-dubious. Lately though, I've not been so sure. Why must we conclude (as many deep thinkers do) that the Universe is completely incomprehensible? It strikes me that in order to conclude this, we must first know a great deal about the Universe, enough to know that incomprehensibility is indeed the case, rather than merely a high level of complexity or perhaps even an underlying simplicity, so simple that we fail to register it. Yet implicit in the argument that we *cannot* know a great deal about the Universe lies the very Ignorance that prevents us from saying anything so explicitly about the nature of the Universe. Logically, the argument destroys itself at this point, since it obviates itself. We simply don't have enough concrete evidence so far, enough information, to *know* whether the Universe is comprehensible or not.

I can't help thinking that scientists who write books about God and the Universe would be better advised to write more scientifically, and less poetically. Much of their problem stems from confusing human descriptions with external reality. This often happens when scientists handle philosophic or metaphysical subjects; they confuse the language for the substance, the word for the thing, and get themselves, and the rest of us, frightfully muddled. They are used to thinking scientifically/logically, and when they encounter metaphysics they continue to apply this methodology, which of course is totally inappro-

"I can't help thinking that scientists who write books about God and the Universe would be better advised to write more scientifically, and less poetically."

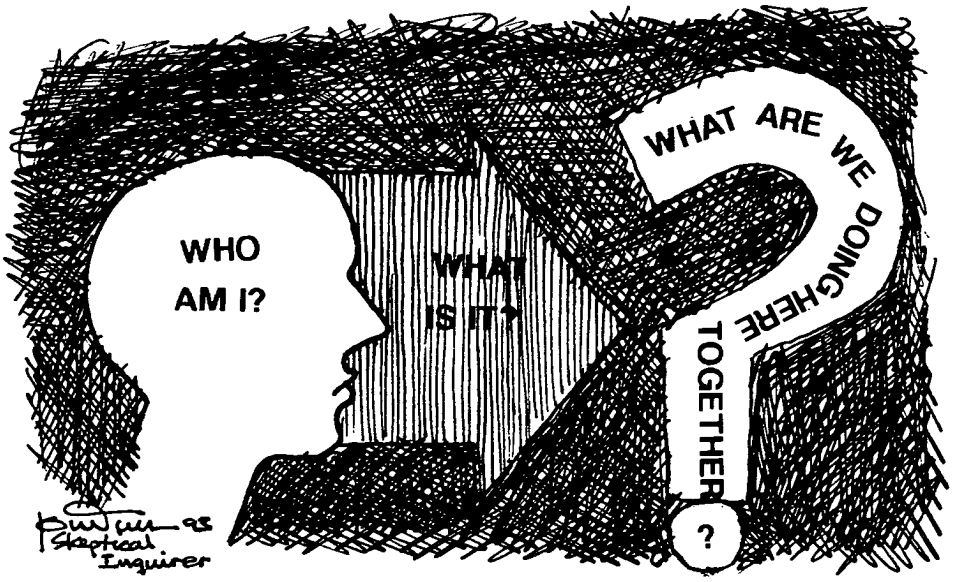
priate for metaphysics. Philosophers and metaphysicians who write about science have the same problem in mirror image, attempting—and failing—to employ *their* methodologies to the exigencies of science. Here is the Two-Culture problem with a vengeance: Total miscomprehension, without even the awareness of it.

A lot of thinkers with scientific-cum-philosophic proclivities, often though not invariably French, insist that the Universe have Sense and Meaning, that is, sense and meaning that accords with *their* ideas and outlooks about sense and meaning. Otherwise, they conclude, it is a very bad, wicked, *méchant* Universe. It is without logic. It is not like them at all. *Voilà.*

Now, I do not know what, if anything, the Universe has in its mind, but I am quite, quite sure that, whatever it has in its mind, it is not at all like what we have in ours. And, considering what most of us have in ours, it is just as well.

One of the main problems about the Universe is in knowing whether or not there is a predetermined Purpose in it. There appears to be no real evidence for it; on the other hand, there appears to be no real evidence against it. At this point in our little teleological Mexican stand-off a lot of people are ready to plump for Purpose, there being, they say, accurately enough, no evidence to the contrary. We have to be careful about "having no evidence to the contrary" and using this fact, or rather, absence of fact, to indicate something. This is the very old logical fallacy of the "negative proof." Having no evidence to the contrary about Purpose in the Universe tells us nothing about that Purpose, including whether or not it exists. Keeping open minds when there's no evidence either way sounds like, and often is, a good thing. But in cases where no evidence is physically possible to come by, a contention about something existing becomes a metaphysical statement and therefore outside the realms of scientific, logical inquiry. My suggestion is to ignore all such statements. An eternity's discussion of them will get nowhere. And we don't have an eternity.

Part of the "Purpose" contention is the age-old Argument from Design, which is just a case of false analogy: from clearly man-made objects we infer the Universe and all things in it to be God-made on analogous principles, i.e., they seem to indicate planned, intelligent construction. There is no question about there being design in the Universe. The question is whether this design is imposed from the Outside or whether it is inherent in the physical laws governing the Universe. The next question is, of course, who or what made these physical laws? One very possible answer is no one, and the question is like asking who made a triangle have three sides. The "laws" are in the nature of things. Presumably, if the nature of things was different, the laws would be different. So far, the matter remains debatable, but that doesn't mean the arguments are equally logical or that the evidence is equally balanced. What evidence we have so far (admittedly inconclusive) leads to a finding that the design is



implicit in the physical nature of things and no Outside, Intelligent Designer is required.

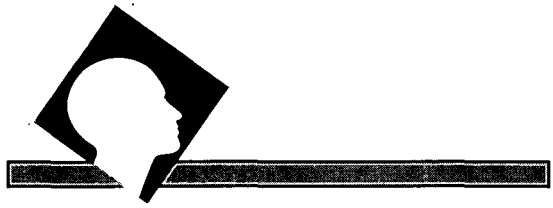
A further trouble with the Argument from Design is that it assumes, for some reason, that the Designer is obsessively concerned with the welfare of human beings, although there is no logical or evidential cause to think this. The latest attempt to do so is the so-called "Anthropic Principle." This states that the Universe is the way it is because we exist. It has not yet occurred to the anthropic principlists that we exist because the Universe is the way it is. When it does, the Anthropic Principle will disappear in a puff of logical deduction.

It is essential that we create sense and meaning—for ourselves. It is not essential, indeed, it is very childish, for us then to extrapolate that sense and meaning *from* us on *to* the rest of the Universe. I like peanut butter and jam sandwiches. That is enough. It is not required, in fact it is an extravagance, that the Universe like peanut butter and jam sandwiches. *My* feelings, *my* opinions are sufficiently meaningful to me for me to enjoy things (such as peanut butter and jam sandwiches and Universes) without the pressing need for pushing an identical propensity onto the Universe. What meaning, what sense there is *we* create to suit ourselves. So long as we bear this in mind, and cease to worry about the Mind of God, we shouldn't behave too foolishly.

Not to behave too foolishly is all that is required of us.

Ralph Estling writes from Ilminster, Somerset, England.

Letters to the Editor



UFO-abduction 'test' lacks validity

Having been one of the many mental-health professionals who received the controversial *Unusual Personal Experiences* booklet I was gratified to see an appropriate response from the SKEPTICAL INQUIRER (Winter 1993) in the form of the excellent special report "3.7 Million Americans Kidnapped by Aliens?" by Lloyd Stires and Philip J. Klass. The authors of the booklet in question presented the results of a national survey concerning the prevalence of certain unusual experiences. However, they then suggested that endorsement of four or five key items may be indicative of a history of UFO-abduction. Part of the *survey*, thus, was used as a *test*. I would like to expand briefly upon Stires's point that the authors of the booklet offer no evidence of validity for the test items. Neither do they offer evidence of validity for the entire "test." The adequacy of the survey as simply a measure of certain unusual experiences is not in question. But the "test" pertaining to UFO-abduction should be held to scientific standards, as is the case with psychological tests.

Psychological tests often use a technique of test construction known as criterion keying. Potential test items are correlated to a known criterion group, and if an item correlates significantly to the criterion group it can be included as a test item regardless of the obviousness or subtlety of the content of the item. The entire test itself, once constructed, is rigorously and scientifically evaluated, and the test is not released for use by professionals until it is shown to have evidence of validity and reliability. If a questionnaire-type test does not use correlational methods to select its items and items are selected based only on common sense or some obvious logical connection to the subject being measured, the items and the test are said to have "face validity." Face validity is considered to be the weakest type of validity. Although the authors of this UFO-abduction test did not specifically claim to have used criterion keying, they do imply that the methodology for item selection was sufficiently sophisticated to warrant the use of somewhat subtle items, as opposed to direct questions about UFO-abduction. Apparently, in the minds of the test authors, the items selected "correlated" with the supposed UFO-abduction "criterion group." As pointed out by Stires, there really is no undisputed UFO-abduction "criterion group." Because the test items were really not selected via a sophisticated, correlational methodology and have only a questionable claim to face validity, it is absurd, as Stires indicates, that the most obvious face-valid item was omitted: "Have you ever been abducted by a UFO?"

Given that this UFO-abduction test's items rely on face validity, one must apply common sense and clinical knowledge and ask whether endorsement of each of the five key items might suggest something other than UFO-abduction. The key questions are listed in Stires's article (p. 143), and alternative interpretations will be listed in order. (1) Klass points out that waking up temporarily paralyzed and seeing unusual things is easily explained as a common and normal hypnopompic hallucination. (2) People with dissociative disorders or who abuse alcohol or certain drugs often have periods of "lost time." (3) As Stires points out, respondents may have been referring to common dreams of flying when asked about "feeling that you were

actually flying." (4) People can see lights in their room as an after image if they are looking at a light in an otherwise dark room and then the light is turned off. Hypnogogic imagery is another possible culprit. (5) People might find puzzling scars on their bodies if the scars occurred in very early childhood, at an age too young for many events to be remembered. Alternately, people in certain clinical groups (primarily dissociative disorders, seizure disorders, and substance-abuse disorders) might deliberately or accidentally injure themselves while in an altered (or intoxicated) mental state and later fail to remember the cause of the injury and the resulting scar. In conclusion, the test questions are questionable.

One cannot rule out on an a-priori basis the possibility, however remote, that certain people endorsed key items on this "test" because they were actually abducted by UFOs. This is one possibility of many. But when one constructs a "test" and presents its results to professionals, the burden of establishing the validity of the test lies with the authors. The authors of the *Unusual Personal Experiences* booklet suggested that 2 percent of the American population may have experienced abduction by UFOs. This conclusion was based on responses to a small number of questions in a test that lacks established validity. As a clinician who is accustomed to treating the usual types of abuse that people inflict upon each other, I will not be in a hurry, based on this UFO-abduction test, to learn how to detect and treat victims of extraterrestrial (ET) abuse.

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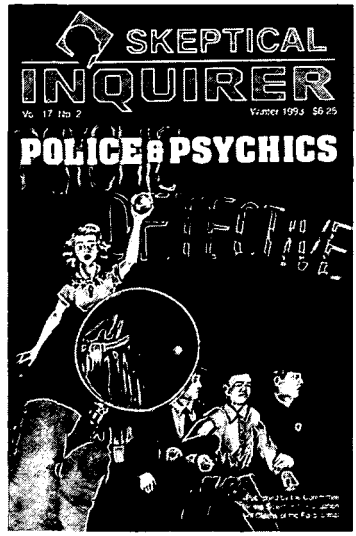
Police and psychics

The article "Psychics: Do Police Departments Really Use Them?" by Jane Ayers Sweat and Mark W. Durm (Winter 1992) does a disservice to us and your readers



by referring to Arthur Lyons and my book *The Blue Sense* as being an example of the "many books that proclaim psychic power." If they had truly read our book (and not perhaps just the highly misleading earlier *SI* review of it by Robert A. Baker), they might see that our position does not endorse psychic abilities at all. The position of our book is strictly agnostic, but what may offend some of *SI*'s writers is the fact that we criticized both the psychics' advocates and their CSICOP critics.

By claiming that our book has a "veil of objectivity" and that we are "subtle proponents of 'the blue sense,' " Sweat and Durm reveal more about their own biases than those of our book. For one thing, we clearly state in our book that what we term "the blue sense" does not necessarily refer to a psychic ability at all. For another, we are not advocates of the blue sense just because we report that many police and some scientists are taking a reasonable position in trying the use of some alleged psychics in dead-end situations. Our position is that we need more research and inquiry and less prejudgment and that a constructive skepticism should be shown toward any questionable claims, whether made by their proponents or critics.

The main reason for this letter, however, is to comment on the survey

Sweat and Durm conducted. Their questions were manifestly biased. For example, questions 4 and 5 did not ask if psychic information proved helpful or valuable, as one might have expected, but if it was "more helpful" or "more valuable" than ordinary information. Despite such obvious biases, their first question ("In the past has your Police Department used psychics or does the department presently use them?") elicited responses that are shocking in a way quite opposite to Sweat and Durm's interpretation.

Even though most previous evidence indicates that psychics have been used more often by rural than by urban police and that when urban police use them they are most often consulted by individual officers (often unofficially) rather than by those at the top of the police bureaucracy (which is concerned that the media might mock such efforts), Sweat and Durm surveyed only urban departments. While 65 percent of the responding departments said they did not use psychics, an extraordinary 35 percent acknowledged having tried them. Since no researcher to my knowledge has ever claimed that most police departments have officially used psychics, and our own book claimed a rather low estimate of actual use (most of which was unofficial, anyway), this admission of official use by 35 percent is quite startling and suggests an enormous increase over what most other analysts have estimated might exist.

Two lesser critical points are worth mentioning: While Sweat and Durm tell us that the police departments of both Philadelphia and Washington, D.C., declined to reply (so presumably were not among the 35 percent of respondents they counted as affirmative), newspaper accounts exist reporting both these departments' past use of psychics. It also should be noted that some of their poll's respondents replied "No" to their question 1, even though extensive major newspaper stories from several of these same cities exist that describe these same departments' past use of psychics. Sweat and Durm seem not to have run any kind of validity checks (as might normally be expected in well-conducted survey research) on the comments by their respondents. In science we should not take a skeptical posture only toward what we don't want to hear.

In sum, then, this purportedly debunking article (apparently hiding behind its own "veil of objectivity") is actually a strong source of evidence that the use of psychics by police is not only widespread but may actually be increasing. In light of their own new data (especially when contrasted with the previously more conservative estimates), Sweat and Durm's conclusion that "there is not a prevalent use of psychics among the police departments of our largest cities" is both misleading and unwarranted. Most objective readers would, I think, view their mere 35 percent as remarkably extensive.

Marcello Truzzi
Professor of Sociology
Eastern Michigan University
Ypsilanti, Mich.

Mark W. Durm responds:

Marcello Truzzi writes, "If they had truly read our book . . . , they might see that our position does not endorse psychic abilities at all." In their book Truzzi and Lyons say:

> *The fact of the matter is that although a serious scientific case for psi does exist, the general scientific community has remained unconvinced.*

Where is this "serious scientific case" for psi? The quoting of anomaly research, Louis Rhine's research, and the Census of Hallucinations *is not quoting "serious" science.*

Furthermore, Truzzi ambiguously writes in his letter: "For one thing, we clearly state in our book that what we term the blue sense does not necessarily refer to a psychic ability at all." But then, on page 11, Lyons and Truzzi offer the following:

> *The "blue sense," named after the common color of police uniforms, is that*

hunch that sends a cop back to that gas station or down an alley; that feeling of impending danger that tells him to draw his gun. It is that unknown quantity in the policeman's decision-making process, the heightened sense of intuition that goes beyond what he can see hear and smell. Because the blue sense specifically relates to the practical application of this unknown faculty to law enforcement, we have chosen to extend the term to cover all those persons—police and non-police—who use psychic powers to solve crimes.

Regarding Truzzi's statement that our questions 4 and 5 were biased, he is incorrect. If one looks at the questionnaire more closely, it is clear that we simply wanted to know if those who had used psychics found them more helpful than other sources, since psychics are claimed to have extraordinary powers.

As for Truzzi's concern that we only surveyed urban departments and not rural ones "even though most previous evidence indicates that psychics have been used more often by rural than urban police. . . .": What *previous evidence?*

Truzzi's comment that the "admission of official use [of psychics] by 35 percent" of the cities' police departments "is quite startling" is a misinterpretation. He should reread the comments of those departments that used psychics; they for the most part make "startling" disclaimers.

Beverly Jaegers

The two articles dealing with psychic detectives (*SI*, Winter 1993) were both interesting and valuable contributions to the information available on the subject. The article by Walter Rowe mentioned Beverly Jaegers, but the author said he could discover little about her or the group of psychic detectives she allegedly organized.

Now retired, Jaegers was a prominent psychic in the late seventies and early eighties. She ran seminar courses on "Enhancing Your ESP." At one of these sessions she told me that even skeptics could be trained to use ESP. (She was wrong, at least in my case.) She had a company called Mind Development & Control, which offered training in becoming a psychic investigator. At the time, her photo and predictions appeared in numerous issues of the *National Enquirer*. *The Star* and *Globe* tabloids ran enthusiastic stories about her work as a psychic gumshoe. She participated in the Atlanta child-murders case, along with many other psychics, with no visible success. Although I asked for specific instances of her success as a psychic, she never provided *any* objective data to support her many claims.

In at least one case she did impress a couple of police officers. The Superintendent of the Missouri State Highway Patrol wrote me, in 1980, about her involvement in one homicide case. He said, in part: "Mrs. Jaegers was brought into the case by the news media, with the approval and consent of the investigating police agencies. Our case files do not reflect, in any great detail, what contribution she made to the case, but I do recall some of her comments were very interesting and very similar to the true facts of the matter when the case was completed." Superintendent Lubker also said that "the Missouri State Highway Patrol does not regularly use the services of any psychic."

In 1979 or 1980 Jaegers formed the U.S. Psi Squad, which the tabloids dubbed the "Psychic S.W.A.T. Squad." Only one of the team's members, Karen C. Uchima, made it past the beginner stage of psychic detective. Jaegers's actual involvement in police cases, at the time, was ambiguous. When I pressed her for names of police she had helped she explained that *all* the law-enforcement people she worked with "prefer to remain anonymous."

According to newspaper accounts, she gave police in Buffalo and Atlanta sketches of possible suspects. In neither case did her efforts yield results. None of the other members of the "Squad," to my knowledge, ever produced any interesting results, but such a group did exist.

Michael R. Dennett
Federal Way, Wash.

Yes, our Buffalo office received a long letter from Bevy (Beverly) Jaegers complaining about the references to her in the article. She lives in Sappington, Missouri. "This . . . article purported to dismiss myself and my work as a disappearing or non-person . . . not to mention coupling my name with that of another person whose work was discredited within the same paragraph . . . thus making it seem as if I were of like ilk." In literature she enclosed, she described herself as a journalist and psychic researcher and not a "psychic." She says she has never approached a police department to offer any impressions on criminal cases—"In my case, police departments sought me *for assistance."*—EDITOR

Oyster rhythms long buried

I am entirely in sympathy with Paul Quincey's reasoning (*SI*, Winter 1993), when he disputes the 1954 claim of the late Frank A. Brown, Jr., that oysters, when transplanted from Connecticut to Illinois, behave as though they "knew" when the moon was passing overhead in their new location. The case against the claim is, however, much stronger than Quincey apparently realizes; his examination of those data simply throws another shovelful of sand onto the grave of a long buried issue.

By reproducing graphs from the original publication, Quincey lends acceptance to Brown's point of departure, that oysters in the laboratory have tidal rhythm—that their shell-opening activity involves a consistent tendency to vary in a 24.8-hour cycle. In fact, however, a thorough reanalysis (J. T. Enright, *J. Theor. Biol.*, 8:426-468, 1965) of those same data (as fully published later: Brown et al., *J. Exper. Zool.*, 131:235-262, Table 3, 1956), as well as of additional data on the activity of oysters and other animals, indicates that Quincey has been too generous. Proper time-series treatment of such data demonstrates that there is no consistent reason to think the oysters, either before or after transplantation, were showing any consistent rhythm with period near 24 hours, so the issue of whether a (probably nonexistent) rhythm changed phase by a few hours after transplantation becomes irrelevant.

Brown used his interpretation of these experiments, and other, similar results, as evidence for his hypothesis that endogenous biological "clocks" do not exist; that biological rhythmicity, as observed under presumably constant conditions in the laboratory, represents nothing more than continuing responsiveness by the organisms to "uncontrolled periodic variables"—that is, to some pervasive, rhythmic "Factor X" from the broader geophysical environment, which then directly evokes rhythmic behavior. With the recognition that much of the evidence invoked to support this hypothesis involves misinterpretation of time-series data (Enright, ibid.), that proposal was rejected by the vast majority of biologists more than 20 years ago. Nearly everyone accepts today that we each have a built-in "biological clock" that can lead to jet lag and to discomfort when we force wakefulness upon unwilling physiological substrate. It remains uncertain whether or not oysters do, too. And while Frank Brown's largely forgotten arguments to the contrary have historical interest, the data themselves deserve, I think, to remain buried without undue attention.

J. T. Enright
Professor of Behavioral Physiology
Scripps Institution of Oceanography

Paul Quincey replies:

While it is good to hear that these data are considered "long buried" by biologists, the point is that they still haunt the rest of us, as can be seen by their continued influence in the general accounts mentioned in the article. All of these were written after 1965, yet none of them refer to Enright's reanalysis published in that year, so apparently news of the burial has been slow to spread.

I hope that drawing attention to its

funeral 28 years ago will now consign this experiment—and others in a similar vein—to history for all of us, as Enright wishes.

Improving science teaching

The reforms suggested by Edmund A. Marek and Wayne Rowe in "Improving Science Teaching in the United States" (*SI*, Winter 1993) are neither new nor unique. The reforms are, however, needed. The excellent learning opportunities that would be provided by following the proposed model would not only improve science education but, if applied to other disciplines, would improve education in these areas as well.

In order for the proposed reforms to occur, and for students to "house build," the following are needed: (1) the opportunity to explore and "house build" without the limits of time; (2) more and better interactions with teachers and other students; (3) easy and constant access to lab equipment and supplies.

My observations of schools suggest that these needs are rarely met; indeed, the structure of many schools seems designed to prevent these reforms from being accomplished. My observations of teachers suggest that they want to accomplish the reforms. Teachers hope desperately for flexible schedules with small classes and adequate facilities.

I agree that "readers of the SKEPTICAL INQUIRER are especially qualified" to influence decisions regarding science teaching in local schools. Those who are literate in and enthused about science need to push for the reforms. Marek and Rowe recommend several questions to pose when investigating science teaching in local schools. I suggest the following be added to the list: How is your school working to improve science education? How can I help implement change? And, finally, if you meet resistance, What must I do to force you to change?

Gary Ackerman
West Rutland, Vt.

Marek and Rowe offer sound suggestions in their excellent article. Their point lying elsewhere, however, they place insufficient emphasis, in my opinion, on the need for competent, interested science teachers. This lack of good teachers is at least as central to our current problems as student lack of interest in science. I offer the following (true) anecdote to illustrate the point.

A few years ago I was approached by a student aware of my undergraduate training as a chemist with a request for assistance with an assignment from his high school chemistry class. The class was using the recommended learning-cycle approach, and teams of students had performed experiments intended to demonstrate the unitary nature of chemical reactions, i.e., that simple reactions always occur in the same proportions due to reproducible molecular structure. Unfortunately, the data would not support any such conclusion. The figures appeared to be random and did not reflect some introduced systematic error. I reviewed the data and the theory with the young man and tried to the best of my ability to explain to him what he should have obtained and what it would have proved.

I asked the student to find out from his teacher why he had not had the students repeat the experiment. (All the students in the class had results as random as the figures I had seen.) I would not have been surprised by a response pleading lack of time or shortage of supplies. What I did not expect was the answer I received, which was that my understanding of the experiment was defective and that the real purpose of the exercise was to teach the students to work together as a group. Therefore, the useless data and undiscovered principle were unimportant and my concern misplaced.

I then took my concern over the level of chemistry teaching to the school's principal. He supported his teacher, explaining that challenging a teacher's competence would open a can of worms he had no interest in facing and that, in any case, none of the students would be going into science anyway. A self-

fulfilling prophecy if I ever heard one.

Nevertheless, I appreciated the article. Keep up the good work, *SI*.

Matthew L. Howard, M.D.
Ukiah, Calif.

You get the idea. I've spoken with Ference and some of her followers, and they are confident that they are in the forefront of scientific progress.

Dan Dugan
San Francisco, Calif.

Therapeutic touch

Thanks for Vern Bullough and Bonnie Bullough's article on Therapeutic Touch (Winter 1993). It reminded me of the Nightingale Society, another nursing pseudoscience cult, based in Carmel, California. I discovered it when I followed up a UPI report, "People Feel Better Under 'Blue' Light."

The Nightingale Society promotes "Human Field Motion," a theory published by Helen M. Ference in her 1979 New York University dissertation "Relationship of Time Experience, Creativity Traits, Differentiation, and Human Field Motion: An Empirical Investigation of Rogers' Correlates of Synergistic Human Development." This theory appears to have developed out of the influence of Martha Rogers, who, as the Bulloughs said, "imbued a whole generation of graduate students with her beliefs' (p. 170). Ference and her followers use a "human field motion test" to collect data on the effects of light on health. They have also discovered the rich interpretive potential of Kirlian photography.

I'd like to quote from a Nightingale Society paper to give you a sense of its style:

> Theoretically defined, HFM is a multidimensional experiential position of the human energy field pattern (Ference 1979, 1989). Rogers' (1986) model assumes human energy fields are known by their pattern and manifestation. Ference defined human field image as "the noticeable appearance of a recognizable pattern profile," which is ever present and accords conditions of shared relative space-time and similar wave frequencies (Ference 1990). . . .

The article on Therapeutic Touch is not correct in the history of this form of treatment. Krieger and other early workers in this field were inspired and influenced by the work of Bernard Grad, a biologist at McGill University, Canada. In the 1950s and 1960s Grad published several studies showing that energy from the hands of a well-known healer, a Hungarian military officer named Esterhazy, could stimulate plant growth and enzyme activity. Grad also showed that if the healer held a glass jug of water and "did his thing" the energy was transferred to the water, which would then stimulate plant growth just as the healer did in person. From the fact that the energy from the healer's hands passed through glass, which is an electrical insulator, Grad concluded that it could not be electricity, but must be a nonelectromagnetic specific biological energy. Grad's work was well-publicized at the time—he was even on radio talk-shows in Canada—and Krieger was one of his students.

Grad has studied under Wilhelm Reich, the discoverer of a nonelectromagnetic specific biological energy that he called "orgone," which has been mentioned in *SI* before. In a conversation in Montreal, Grad told me of having once seen Reich heal a sick infant without touching it, just by bringing his hand near it. Grad's research was strongly influenced by Reich's orgone theories, so Wilhelm Reich and orgone energy should be regarded as the true historical starting point of modern Therapeutic Touch.

Joel Carlinsky
Hawley, Mass.

Humphrey's parapsychology fellowship

There are several points in Lewis Jones's note on the appointment of Nicholas Humphrey to the senior research fellowship in parapsychology at Darwin College, Cambridge (*SI*, News and Comment, Winter 1993), that I should like to comment on.

First, the money to pay Humphrey will come from the Perrott-Warrick fund, as opposed to the "Perrott and Warwick" fund.

Second, critics of his appointment were worried by such comments as: "I want to show not only that these things don't happen, but that they are logically impossible. . . ." This was felt to be an unscientific attitude.

Third, where does it say that the declared purpose of the early Society for Psychical Research was to "demonstrate the survival of the soul empirically," as Lewis Jones asserts? Its stated aim has always been "to examine without prejudice or prepossession and in a scientific spirit those faculties of man, real or supposed, which appear to be inexplicable in terms of any generally recognized hypothesis." Which is more than can be said for Humphrey, it would seem.

Tom Ruffles
West Winch, Norfolk, U.K.

More on 'Mars effect'

I read with interest and some amusement the response by Suitbert Ertel (*SI*, Letters, Winter 1993) to my criticism (Summer 1992) of his "Mars effect" methodology (Winter 1992). His defense was in two parts. First, there wasn't any bias because "eminent" people were selected from 21 "references." Second, the experiment of selecting newborns and predicting which would become "eminent" couldn't be done because no one would fund selecting 10,000 babies for subsequent tracking.

As to his first defense, I have not read the original research underlying Ertel's article, but apparently Paul Kurtz has. SKEPTICAL INQUIRER's Winter 1992 issue contained Kurtz's dissent, which pointed out weaknesses in Ertel's work. For example, in the original research the definition of "eminent" kept changing. Then, in the case of U.S. athletes, Kurtz's computations didn't show any effect, but a subsequent analysis by the investigator, *with football and basketball players dropped*, did. If Las Vegas would let me make a series of theoretical bets at roulette and then pay me on the results after some of the losers were dropped, even I could win. I note that Ertel did not respond to Kurtz's criticism.

Ertel's second defense is a nit-picking quibble about the design of an experiment. He completely ignored the *purpose* of the experiment, which was to demonstrate the ability to predict using the claimed effect. I don't care how many babies are chosen, provided it is a valid sample. He at least ought to be able to predict which of a sample's babies will be extolled in the pages of 21 "references" in years to come.

David J. Simmons
Ridgecrest, Calif.

QM doesn't invalidate realism

Jonathan Dowling's letter in your Winter 1992 issue illustrates a pseudoscientific belief that has gained disturbingly wide acceptance, even among scientists. He claims that realism, meaning the principle that "the world exists independently of those who study it," has been invalidated by quantum physics. He cites studies that he claims support his conclusion.

Only one type of experimental result could invalidate the principle of realism: one in which two competent observers examined the same event, under precisely the same conditions, and yet saw different events that could not be ascribed to differences in the observers' sensor apparatus or any other cause.

While I am not a physicist, I have some familiarity with the Bell inequality and the experiments relating to it, and I have not heard of any results invalidating realism from these experiments. As Mario Bunge pointed out in his reply, the invalidation of locality (or any other commonsense idea) doesn't invalidate realism. On the contrary, it is because we accept the independence of reality that we accept these counter-intuitive discoveries when sufficient evidence is provided for them.

Dowling wishes to cut science loose from philosophy, giving the scientific method the status of a "guardian angel." But if we regarded the scientific method as true simply because we believed it, and not because of any philosophical considerations, we would indeed be engaging in theology. Without philosophy, we would have no validation of the laws of logic (on which Dowling explicitly relies), nor any other reason to consider science more valid than Tarot reading. The scientific method has value only if reality is independent of the observer. Certainly there has been a great deal of bad philosophy; but it is impossible to escape philosophy altogether. Giving the scientific method the status of an epistemological primary, independent of all prior considerations, is itself a philosophical position—and, I think, an untenable one.

Gary McGath
Penacook, N.H.

In defense of economics

In his response to my critical letter (*SI*, Winter 1993), Mario Bunge abandoned his cryptic, emotional attack on economists and revealed that in his opinion economics is a pseudoscience. In presenting the reasons for his opinion he ignored the five demarcation criteria proffered in his original article (*SI*, Summer 1992). While the appropriateness of these may be debated, one should expect Bunge to use his own criteria in reaching such a conclusion. Had he done so, he would have found that economics measures up as well as any social science. Rather, he chose to list six irrelevant and ambiguous reasons unrelated to his own criteria.

It is suggested that a basic exercise may prove interesting to the reader. Since the failure to satisfy these ad-hoc reasons indicates that economics is a pseudoscience, any "real" science must satisfy their negated generalization. I suggest that the reader negate and generalize each reason, and then ask: "Can any other field of knowledge generally accepted as 'science' conform to these criteria?" For example, from Bunge's first reason, ". . . A key concept of the theory . . . is not mathematically well defined," one obtains, " 'Science' should be able to state all key concepts of a theory in well-defined mathematical form." Clearly, this criterion would eliminate all disciplines that we currently identify as science. The growing evidence of nonlinear dynamics suggests that the "real world" works chaotically, not mathematically. Therefore, precise mathematical specification of key concepts is impossible and does not merely depend upon obtaining additional empirical knowledge, because the "real world" does not "work" that way.

Lewis Freiberg
Professor of Economics
Northeastern Illinois University
Chicago, Ill.

Subliminal claims moderating?

The special issue on "Myths of Subliminal Persuasion" (*SI*, Spring 1992) not only was interesting and timely but appears to be contributing to some manufacturers of subliminal products revising their publicity statements.

For example, I noticed the recent advertising brochure of one of the larger distributors of subliminal self-help audio cassettes (Potentials Unlimited) included the following note: "No therapeutic claims of any kind are made with regard to these tape programs. We believe cures

or improvements are a result of mind over matter and these tapes are not intended as a substitute for seeing your physician, or for medical treatment."

This is a significant depature from past statements. It is my belief that *SI* in concert with a few other publications showing the ineffectiveness of subliminal products has helped lead to these revisions. Let's hope that in the next year or two, we will see the general public begin to respond to the message coming from the scientific community and stop buying these products.

Bryan C. Auday
Department of Psychology
Gordon College
Wenham, Mass.

Angels avoid testing

In my account of the American Conference on Angels (*SI*, Fall 1992), I noted that if angels can perceive the real world through the perceptions of the people they're serving—as suggested by Karyn Martin-Kuri, the North Falmouth, Massachusetts, woman who claims to be able to see and communicate with angels—a simple test for the existence of angels would be to look at a playing card and allow my guardian angel to relay the card's identity to Martin-Kuri.

After several SKEPTICAL INQUIRER readers called her toll-free line to conduct such a test, Martin-Kuri informed me that my report was inaccurate. Readers will be saddened to know that angels can't see objects, even indirectly. "They can only see a relationship to an object," she said.

Even if you designed a test using names or relationships, it wouldn't work, Martin-Kuri said. (I could have sworn she explained the reason this test wouldn't work is that angels are easily confused by a person's past lives. But when I raised that issue later, she said that I had, once again, misunderstood her because angels can't be confused.)

Ultimately, no experiment could be devised, she said, because angels "would refuse to cooperate. Angels have a higher calling than can be exploited in immature parlor games. God and angelic beings of light are not to be mocked and it is not necessary for truth to be defended."

Thus, as with people who insist they can see auras, fairies, and the like, testing the claims of people who say they can see angels can be devilishly difficult.

C. Eugene Emery Jr.
Providence Journal
Providence, R.I.

Rosalind Heywood

In "Francis Huxley's Alternative View of the Universe" (*SI*, Fall 1992), John Pen La Farge mentions the name of an English author and clairvoyant who has written some books on behalf of the British Society for Psychical Research (SPR). He called her "Rosiland Heywood." As a longtime subscriber to the *Journal of the SPR* (and to the SKEPTICAL INQUIRER), I didn't know anybody by that name. I then realized that it had to be Rosalind Heywood. Heywood, who died some years ago, was the author of two books on psychical research, *The Sixth Sense* and *The Infinitive Hive*. I gather La Farge heard her name as it was mentioned by Huxley and wrote it down phonetically.

Werner Eeman
Lede, Belgium

Kervran and macrobiotics

I read Walter Hearn's excellent article (*SI*, Forum, Fall 1992) on Louis Kervran's belief in the biological transmutation of the chemical elements with great interest. It occurred to me that your readers might be interested in the lasting influence that Kervran has had on the macrobiotic cult.

Zen Macrobiotics, by George Ohsawa (1965), tells of an experiment performed by Ohsawa. "On June 21, 1964 in Tokyo, I completed the transmutation of the element sodium (Na) into potassium (K)

under laboratory conditions of low temperature, pressure and energy." Instead of explaining how he performed this feat of alchemy, Ohsawa cites the work of Kervran as confirmation.

Biological transmutation allows Ohsawa to dismiss the idea "that there is a need for externally produced oil, protein, calcium or vitamin C. . . ." Indeed, he tells that "man must not borrow elements from nature as he does when he doses himself with specifics such as iron, calcium, vitamin C, and sugar substitutes, to name a few. He must be independent and manufacture his needs within his organism, by and for himself."

This is, of course, the rationale for Oshawa's infamous Diet No. 7, where only brown rice is eaten.

Jeremy Genovese
Shaker Heights, Ohio

Not so harmless

Taras Wolansky (Letters, Winter 1993) urges us to let people go on believing in life after death, because it is "harmless."

People who are convinced that death is not final are most dangerous. They may not only be prepared to lose their own life (which is their affair) but take the lives of others (who may not share their belief). Even more dangerous is a country with mass-destruction weapons ruled by people who believe that their god wants them to destroy another country ruled by people who do not share their belief. Does Wolansky regard the rise of Islamic fundamentalism as "harmless"?

Steuart Campbell
Edinburgh, Scotland, U.K.

The letters column is a forum for views on matters raised in previous issues. Brief letters (less than 250 words) are welcome. All letters are subject to editing. They should be typed double-spaced. Due to the volume of letters, not all can be published. Address them to Letters to the Editor, SKEPTICAL INQUIRER, 3025 Palo Alto Dr. NE, Albuquerque, NM 87111.

Science and Deep Questions of Origins

Every human community has somehow or other tried to understand . . . deep questions of origins. Origin of our group, whatever it is, origin of our species, origin of life, origin of Earth, origin of the universe. I think you have to be made out of wood not to be interested in these questions. And there's no way to understand even the questions, much less the answers, without understanding science.

—Carl Sagan, at the national meeting of the American Astronomical Society, Phoenix, January 5, 1993, where he received the first Annenberg Award for leadership in astronomical education.

Local, Regional, and National Skeptics Organizations

The organizations listed below have aims similar to those of CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these organizations cannot speak on behalf of CSICOP.

UNITED STATES

ALABAMA. **Alabama Skeptics,** Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-759-2624).

ARIZONA. **Tucson Skeptical Society** (TUSKS), James McGaha, Chairman, 5655 E. River Rd., Suite #101-127, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85028.

CALIFORNIA. **Bay Area Skeptics,** Wilma Russell, Secretary, 17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 94620 (415-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772). **Skeptics Society** (Los Angeles). Contact Michael Shermer, 2761 N. Marengo Ave., Altadena 91001.

COLORADO and WYOMING. **Rocky Mountain Skeptics,** Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

DISTRICT OF COLUMBIA, DELAWARE, MARYLAND, and VIRGINIA. **National Capital Area Skeptics,** c/o D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. **Tampa Bay Skeptics,** Gary Posner, 6219 Palma Blvd., #210, St. Petersburg, FL 33715 (813-867-3533).

GEORGIA. **Georgia Skeptics,** Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. **Midwest Committee for Rational Inquiry,** Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomburg, Chairman, P.O. Box 20302, Springfield IL 62708.

INDIANA. **Indiana Skeptics,** Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. **Kentucky Assn. of Science Educators and Skeptics** (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. **Baton Rouge Proponents of Rational Inquiry and Scientific Methods** (BR-PRISM), c/o Wayne R. Coskrey, P.O. Box 82060, Baton Rouge, LA 70884-2060.

MASSACHUSETTS. **Skeptical Inquirers of New England.** Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. **Great Lakes Skeptics,** Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, MI 84230-1116.

MINNESOTA. **Minnesota Skeptics,** Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416. **St. Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. **Kansas City Committee for Skeptical Inquiry,** Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

NEW MEXICO. **New Mexicans for Science & Reason,** John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. **Finger Lakes Association for Critical Thought,** Ken McCarthy, 107 Williams St., Groton, NY 13073. **New York Area Skeptics** (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massapequa, NY 11758, (516) 798-6902. **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. **South Shore Skeptics,** Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014, (513) 369-4872 or (606) 581-7315.

PENNSYLVANIA. **Paranormal Investigating Committee of Pittsburgh** (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217 (412-521-2334).

SOUTH CAROLINA. **South Carolina Committee to Investigate Paranormal Claims,** John Safko, 3010 Amherst Ave., Columbia, SC 29205.

TEXAS. **Houston Association for Scientific Thinking** (HAST), Darrell Kachilla, P.O. Box 541314, Houston, TX 77254. **North Texas Skeptics,** Joe Voelkering, President, P.O. Box 111794, Carrollton, TX 75011-1794. **West Texas Society to Advance Rational Thought,** Co-Chairmen: George Robertson, 4700 Polo Pky., Apt. 183, Midland, TX 79705-1542 (915-367-3519); Don Naylor, 404 N. Washington, Odessa, TX 79761.

WASHINGTON. **The Society for Sensible**

(continued on next page)

Explanations, P.O. Box 7121, Seattle, WA 98133.

WISCONSIN. Wisconsin Committee for Rational Inquiry, Mary Beth Emmericks, Convenor, 8465 N. 51st St., Brown Deer, WI 53223.

ARGENTINA. CAIRP, Director, Ladislao Enrique Marquez, Jose Marti, 35 dep C, 1406 Buenos Aires.

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